Ontario Northland

Request for Proposals

for

Cochrane Outdoor Electrical Distribution Upgrade

Request for Proposals No.: **RFP 2026 045**

Issued: **Friday, June 12, 2026**

Submission Deadline: **Monday, July 13, 2026 at 2:00:00 PM EDT**

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PART 1 - INVITATION AND SUBMISSION INSTRUCTIONS

1.1 Invitation to Proponents

1.1.1 Invitation

This Request for Proposals (the "RFP") is an invitation by Ontario Northland Transportation Commission **(**"ONTC") to prospective proponents to submit proposals for the design build of the **Cochrane Outdoor Electrical Distribution Upgrade**, as further described in Section A of the RFP Particulars (Appendix B) (the "Deliverables").

ONTC is an agency of the Province of Ontario that provides reliable and efficient transportation services to northern and rural communities. For over 120 years, the company has provided integrated and impactful transportation services including rail freight, passenger rail, motor coach transportation, rail repair, and remanufacturing services.

ONTC's rail services are vital in maintaining a reliable supply chain in Northern Ontario by connecting freight customers to global economies. The forestry industry, mining operations, farming communities, and manufacturers count on ONTC's services to deliver large volumes across vast distances. The company's 675 miles of mainline track span throughout northeastern Ontario and northwestern Quebec.

ONTC motor coaches connect rural Ontario to major centres providing access to education, medical appointments, shopping, and seamless connections to other transportation providers. The Polar Bear Express passenger train connects Moosonee and Cochrane, Ontario, providing an all-season land link for Indigenous communities on the James Bay Coast.

Improving and repairing transportation equipment is also a large part of ONTC's service offering. We remanufacture and repair locomotives, passenger rail cars, freight cars, and more. ONTC's unique mechanical skillset attracts new business and secures skilled trades jobs in Northern Ontario.

ONTC makes provincial dollars reach further by creating innovative solutions that help drive economic growth sustainably, responsibly, and with future generations top of mind. Throughout the agency, modernization is underway with many exciting projects that will improve how we operate. ONTC employs over 1,000 people including Locomotive Engineers, Motor Coach Operators, skilled tradespeople, and business professionals. Employees work together to improve and deliver services that provide value to the regions served.

The Cochrane Shop complex has an outdoor main transformer and outdoor electrical switchgear enclosure including 6 switchgear breakers that supplies power to all the shop buildings and wayside power at 326 Second Street, Cochrane, ON. These have been installed in the late 1980's and are supplied by a customer owned high voltage line. The 2000 kVA transformer is in poor condition with an elevated risk of failure due to a severe corrosion of high side bushing enclosure, and significant percentage difference in secondary winding resistance. The electrical switchgear breaker includes Siemens RL breakers that are now obsolete.

1.1.2 Proponent Must Be Single Entity

The proponent must be a single legal entity that, if selected, intends to enter into the contract with ONTC. If the proposal is being submitted jointly by two (2) or more separate entities, the proposal

must identify only one (1) of those entities as the “proponent”. The proponent will be responsible for the performance of the Deliverables.

1.1.3 Bidding System Registration

All proponents must have a vendor account with the electronic bidding system at: https://www.merx.com/. This will enable the proponent to download the solicitation document, to receive addenda email notifications, download addenda, and submit their proposal electronically through the bidding system.

1.2 RFP Contact

For the purposes of this procurement process, the “RFP Contact” will be:

Nicole Laplante
Procurement Contracts Specialist
Telephone: 705-472-4500 or 1-800-363-7512, Ext. 588
Email: nicole.laplante@ontarionorthland.ca

Proponents and their representatives are not permitted to contact any employees, officers, agents, elected or appointed officials, or other representatives of ONTC, other than the RFP Contact, concerning matters regarding this RFP. Failure to adhere to this rule may result in the disqualification of the proponent and the rejection of the proponent’s proposal.

1.3 Accommodations for Proponents with Disabilities

In accordance with the Ontario Human Rights Code, Ontarians with Disabilities Act, 2001 (ODA) and Accessibility for Ontarians with Disabilities Act, 2005 (AODA), ONTC will accommodate for a disability, ensuring full and equitable participation throughout the RFP process. If a proponent requires this RFP in a different format to accommodate a disability, the proponent must contact the RFP Contact as soon as possible and in any event prior to the Submission Deadline. The RFP in the different format will be issued only to the requesting proponent and all addenda will be issued in such different format only to the requesting proponent.

1.4 French Language Services

In accordance with the French Language Services Act, R.S.O. 1990, c. F.32, and Ontario Regulation 544/22, ONTC is committed to providing equitable access to procurement opportunities in both official languages. While this RFP and associated documents are posted in English, a French version may be available upon request. Interested parties may contact the RFP Contact.

1.5 Contract for Deliverables

1.5.1 Type of Contract

The selected proponent will be required to enter into an agreement with ONTC for the provision of the Deliverables in the form attached as Appendix A to the RFP (the “Agreement”).

1.5.2 Term of Contract

The term of the Agreement will be in effect until the completion of the Deliverables.

1.6 RFP Timetable

1.6.1 Key Dates

Issue Date of RFP	Friday, June 12, 2026
Site Visit / Pre-Bid Meeting	Thursday, June 25, 2026 at 11:00 AM EDT
Deadline for Questions	Tuesday, July 7, 2026 at 4:00:00 PM EDT
Deadline for Issuing Addenda	Thursday, July 9, 2026 at 4:00:00 PM EDT
Submission Deadline	Monday, July 13, 2026 at 2:00:00 PM EDT
Anticipated Execution of Agreement	Monday, August 17, 2026
Irrevocability Period	Ninety (90) calendar days

The RFP timetable is tentative only and may be changed by ONTC at any time.

1.6.2 Site Visit / Pre-Bid Meeting

A Mandatory Site Visit will be held at the Cochrane Shop located at 326 Second Street, Cochrane, ON, on Thursday, June 25, 2026 at 11:00 a.m. Proponents are required to complete the Site Visit Registration Form and Release of Liability Form located at Appendix D, and return to Nicole Laplante no later than 4:00:00 p.m. on Wednesday, June 24, 2026.

1.7 Submission Instructions

1.7.1 Submission of Proposals

Proposals must be submitted electronically through the bidding system at:
https://www.merx.com/

Submissions by other methods will not be accepted.

In the event of any technical issues, proponents should contact the bidding system's technical support.

MERX Customer Support
Phone 1-800-964-6379
Email merx@merx.com

The Technical Proposal shall be uploaded into the bidding system, in PDF format, and not have a security password. It is the proponent's sole responsibility to ensure all uploaded documents are not defective, corrupted, or blank and can be opened by ONTC. If the Technical Proposal cannot be downloaded by ONTC, the Proposal shall be rejected.

The Pricing Proposal shall be uploaded into the bidding system. No pricing information shall be uploaded as part of the Technical Proposal as this is a **two-envelope process**.

1.7.2 Proposals to Be Submitted on Time

Proposals must be finalized and fully uploaded in the bidding system on or before the Submission Deadline. The time of receipt of proposals shall be determined by the bidding system web clock. Late submissions will not be accepted by the bidding system and will be disqualified as late.

Proponents are cautioned that the timing of submission is based on when the proposal is received by the bidding system, not when a proposal is submitted by a proponent. As transmission can be delayed due to file transfer size, transmission speed, or other technical factors, proponents should plan to submit proposals well in advance of the Submission Deadline to avoid submitting late due to technical issues. Proponents submitting near the Submission Deadline do so at their own risk.

The bidding system will send a confirmation email to the proponent advising when the proposal was submitted successfully. If you do not receive a confirmation email, contact the bidding system's technical support immediately.

1.7.3 Proposals to Be Submitted in Prescribed Format

Proposal materials should be prepared and submitted in accordance with the instructions in the bidding system, including any maximum upload file size.

Documents should not be embedded within uploaded files, as the embedded files may not be accessible or evaluated.

1.7.4 Amendment of Proposals

Proponents may amend their proposals prior to the Submission Deadline. However, the proponent is solely responsible for ensuring that the amended proposal is received by the bidding system by the Submission Deadline.

1.7.5 Withdrawal of Proposals

Prior to the Submission Deadline, proponents may withdraw a submitted proposal through the bidding system.

1.7.6 Proposals Irrevocable after Submission Deadline

Proposals shall be irrevocable for the Irrevocability Period, as specified in the RFP Timetable, running from the moment that the Submission Deadline passes.

[End of Part 1]

PART 2 - EVALUATION AND AWARD

2.1 Stages of Evaluation

ONTC will conduct the evaluation of proposals in the following stages:

2.2 Stage I - Mandatory Submission Requirements

Stage I will consist of a review to determine which proposals comply with all of the mandatory submission requirements. Proposals that do not comply with all of the mandatory submission requirements as of the Submission Deadline will, subject to the express and implied rights of ONTC, be rejected. The mandatory submission requirements are listed in Section C of the RFP Particulars (Appendix B).

2.2.1 No Amendment to Forms

Other than inserting the information requested on the mandatory submission forms set out in the RFP, a proponent may not make any changes to any of the forms. Any proposal containing any such changes, whether on the face of the form or elsewhere in the proposal, may be disqualified.

2.3 Stage II - Evaluation

Stage II will consist of the following two (2) sub-stages:

2.3.1 Mandatory Technical Requirements

ONTC will review the proposals to determine whether the mandatory technical requirements as set out in Section D of the RFP Particulars (Appendix B) have been met. Proposals that do not comply with all of the mandatory technical requirements will, subject to the express and implied rights of ONTC, be rejected.

2.3.2 Non-Price Rated Criteria

ONTC will evaluate each qualified proposal on the basis of the non-price rated criteria as set out under Initial Evaluation Criteria in Section F of the RFP Particulars (Appendix B).

2.4 Stage III - Pricing

Stage III will consist of a scoring of the submitted pricing of each qualified proposal in accordance with the price evaluation method set out in Section G of the RFP Particulars (Appendix B). The evaluation of price will be undertaken after the evaluation of mandatory requirements and rated criteria has been completed.

In the event that a proponent’s pricing appears to be abnormally low in relation to the Deliverables, ONTC may require the proponent to provide a detailed explanation of the pricing information to account for the low level of price and confirm that all requirements in respect of the Deliverables have been taken into account. If the proponent is unable to satisfactorily account for the abnormally low pricing, ONTC may reject the proposal. ONTC may also reject any proposal that contains unbalanced pricing. Pricing may be considered unbalanced where nominal or significantly understated prices are proposed for some elements of the Deliverables and inflated prices are proposed for other elements of the Deliverables. Unbalanced pricing includes, but is

not limited to, “front-loaded” pricing which contains inflated pricing for Deliverables to be provided or completed at the beginning of the contract, offset by understated pricing for Deliverables to be provided or completed later in the contract.

2.5 Selection of Top-Ranked Proponent

After the completion of Stage III, all scores from Stage II and Stage III will be added together and proponents will be ranked based on their total scores. Subject to the reserved rights of ONTC, the top-ranked proponent will be selected to enter into the Agreement in accordance with the following section. In the event of a tie, the selected proponent will be the proponent with the lowest price.

2.6 Notice to Proponent and Execution of Agreement

Notice of selection by ONTC to the selected proponent shall be in writing. The selected proponent shall execute the Agreement in the form attached as Appendix A to this RFP and satisfy any other applicable conditions of this RFP, including the pre-conditions of award listed in Section E of the RFP Particulars (Appendix B), within fifteen (15) days of notice of selection. This provision is solely for the benefit of ONTC and may be waived by ONTC.

2.7 Failure to Enter into Agreement

If a selected proponent fails to execute the Agreement or satisfy any pre-conditions of award within fifteen (15) days of notice of selection, ONTC may, without incurring any liability, proceed with the selection of another proponent and pursue all other remedies available to ONTC.

[End of Part 2]

PART 3 - TERMS AND CONDITIONS OF THE RFP PROCESS

3.1 General Information and Instructions

3.1.1 RFP Incorporated into Proposal

All of the provisions of this RFP are deemed to be accepted by each proponent and incorporated into each proponent's proposal. A proponent who submits conditions, options, variations, or contingent statements inconsistent with the terms set out in this RFP, including the terms of the Agreement in Appendix A, either as part of its proposal or after receiving notice of selection, may be disqualified. If a proponent is not disqualified despite such changes or qualifications, the provisions of this RFP, including the Agreement set out in Appendix A, will prevail over any such changes or qualifications in the proposal.

3.1.2 Proponents to Follow Instructions

Proponents should structure their proposals in accordance with the instructions in this RFP. Where information is requested in this RFP, any response made in a proposal should reference the applicable section numbers of this RFP.

3.1.3 Proposals in English

All proposals are to be in English only.

3.1.4 No Incorporation by Reference

The entire content of the proponent's proposal should be submitted in a fixed format, and the content of websites or other external documents referred to in the proponent's proposal, but not attached, will not be considered to form part of its proposal.

3.1.5 Past Performance

In the evaluation process, ONTC may consider the proponent's past performance or conduct on previous contracts with ONTC or other institutions.

3.1.6 Information in RFP Only an Estimate

ONTC and its advisers make no representation, warranty, or guarantee as to the accuracy of the information contained in this RFP or issued by way of addenda. Any quantities shown or data contained in this RFP or provided by way of addenda are estimates only and are for the sole purpose of indicating to proponents the general scale and scope of the Deliverables. It is the proponent's responsibility to obtain all the information necessary to prepare a proposal in response to this RFP.

3.1.7 Proponents to Bear Their Own Costs

The proponent will bear all costs associated with or incurred in the RFP process, including, without limitation, preparation and presentation of its proposal and if applicable, costs incurred for meeting attendance, interviews or demonstrations.

3.1.8 Proposal to be Retained by ONTC

ONTC will not return the proposal or any accompanying documentation submitted by a proponent.

3.1.9 No Guarantee of Volume of Work or Exclusivity of Contract

ONTC makes no guarantee of the value or volume of work to be assigned to the selected proponent. The Agreement will not be an exclusive contract for the provision of the described Deliverables. ONTC may contract with others for goods and services the same as or similar to the Deliverables or may obtain such goods and services internally.

3.1.10 Trade Agreements

Proponents should note that procurements falling within the scope of the Ontario-Quebec Trade and Co-operation Agreement, Canadian Free Trade Agreement, and Comprehensive Economic and Trade Agreement are subject to those trade agreements but that the rights and obligations of the parties will be governed by the specific terms of this RFP.

3.2 Communication after Issuance of RFP

3.2.1 Proponents to Review RFP

Proponents shall promptly examine all of the documents comprising this RFP, and

(a) shall report any errors, omissions, or ambiguities; and
(b) may direct questions or seek additional information

in writing by email to the RFP Contact on or before the Deadline for Questions. No such communications are to be sent or initiated through any other means. ONTC is under no obligation to provide additional information, and ONTC is not responsible for any information provided by or obtained from any source other than the RFP Contact or the bidding system. It is the responsibility of the proponent to seek clarification on any matter it considers to be unclear. ONTC shall not be responsible for any misunderstanding on the part of the proponent concerning this RFP or its process.

3.2.2 All New Information to Proponents by Way of Addenda

This RFP may be amended only by addendum in accordance with this section. If ONTC, for any reason, determines that it is necessary to provide additional information relating to this RFP, such information will be communicated to all proponents by addendum posted in the bidding system.

Each addendum forms an integral part of this RFP and may contain important information, including significant changes to this RFP. Proponents are responsible for obtaining all addenda issued by ONTC.

3.2.3 Post-Deadline Addenda and Extension of Submission Deadline

If ONTC determines that it is necessary to issue an addendum after the Deadline for Issuing Addenda, ONTC may extend the Submission Deadline for a reasonable period of time.

3.2.4 Verify and Clarify

When evaluating proposals, ONTC may request further information from the proponent or third parties in order to verify or clarify the information provided in the proponent's proposal. The response received by ONTC shall, if accepted by ONTC, form an integral part of the proponent's proposal.

3.3 Notification and Debriefing

3.3.1 Notification to Other Proponents

Once the Agreement is executed by ONTC and a proponent, the other proponents may be notified directly in writing and shall be notified by public posting, on ONTC's website, of the outcome of the procurement process.

3.3.2 Debriefing

Proponents may request a debriefing after receipt of a notification of the outcome of the procurement process. All requests must be in writing to the RFP Contact and must be made within sixty (60) days of such notification. The RFP Contact will contact the proponent's representative to schedule the debriefing. Debriefings may occur by way of conference call or other remote meeting format as prescribed by ONTC.

3.3.3 Procurement Protest Procedure

Any proponent with concerns about the RFP process is required to attend a debriefing prior to proceeding with a protest.

If, after attending a debriefing, the proponent wishes to challenge the RFP process, it should provide written notice to the RFP Contact in accordance with applicable procurement protest procedures. The written notice must contain:

(a) a clear statement as to which procurement the proponent wishes to challenge;
(b) a clear explanation of the proponent's concerns with the procurement, including specifics as to why it disagrees with the procurement process or its outcome; and
(c) the proponent's contact details, including name, telephone number, and email address.

ONTC will send an initial response to acknowledge receipt of the proponent's notice and indicate the date by which ONTC will provide the proponent with a formal response.

3.4 Conflict of Interest and Prohibited Conduct

3.4.1 Conflict of Interest

For the purposes of this RFP, the term "Conflict of Interest" includes, but is not limited to, any situation or circumstance where:

(a) in relation to the RFP process, the proponent has an unfair advantage or engages in conduct, directly or indirectly, that may give it an unfair advantage, including, but not limited to:

(i) having or having access to confidential information of ONTC in the preparation of its proposal that is not available to other proponents;
(ii) having been involved in the development of the RFP, including having provided advice or assistance in the development of the RFP;
(iii) receiving advice or assistance in the preparation of its response from any individual or entity that was involved in the development of the RFP;
(iv) communicating with any person with a view to influencing preferred treatment in the RFP process (including, but not limited to, the lobbying of decision-makers involved in the RFP process); or
(v) engaging in conduct that compromises, or could be seen to compromise, the integrity of the open and competitive RFP process or render that process non-competitive or unfair; or

(b) in relation to the performance of its contractual obligations under a contract for the Deliverables, the proponent's other commitments, relationships, or financial interests:

(i) could, or could be seen to, exercise an improper influence over the objective, unbiased, and impartial exercise of its independent judgement; or
(ii) could, or could be seen to, compromise, impair, or be incompatible with the effective performance of its contractual obligations.

3.4.2 Disqualification for Conflict of Interest

ONTC may disqualify a proponent for any conduct, situation, or circumstances, determined by ONTC, in its sole and absolute discretion, to constitute a Conflict of Interest as defined above.
An existing supplier of ONTC may be precluded from participating in the RFP process in instances where ONTC has determined that the supplier has a competitive advantage that cannot be adequately addressed to mitigate against unfair advantage. This may include, without limitation, situations in which an existing supplier is in a position to create unnecessary barriers to competition through the manner in which it performs its existing contracts, or situations where the incumbent fails to provide the information within its control or otherwise engages in conduct obstructive to a fair competitive process.

3.4.3 Disqualification for Prohibited Conduct or Breach

ONTC may disqualify a proponent, rescind a notice of selection, or terminate a contract subsequently entered into if ONTC determines in its sole and absolute discretion that the proponent has engaged in any conduct prohibited by this RFP or has otherwise breached the terms of the of the RFP.

3.4.4 Prohibited Proponent Communications

Proponents must not engage in any communications that could constitute a Conflict of Interest and should take note of the Conflict of Interest declaration set out in the Submission Form (Appendix C).

3.4.5 Proponent Not to Communicate with Media

Proponents must not, at any time directly or indirectly, communicate with the media in relation to this RFP or any agreement entered into pursuant to this RFP without first obtaining the written permission of the RFP Contact. Further, proponents must not make any media release, social

media or Internet post, public announcement or public disclosure (whether for publication in the press, on the radio, television, internet or any other medium) that relates to the RFP process, the solicitation documents or the Deliverables or any matters related thereto, without the prior written consent of ONTC.

3.4.6 No Lobbying

Proponents must not, in relation to this RFP or the evaluation and selection process, engage directly or indirectly in any form of political or other lobbying whatsoever to influence the selection of the selected proponent(s).

3.4.7 Illegal or Unethical Conduct

Proponents must not engage in any illegal business practices, including activities such as bid-rigging, price-fixing, bribery, fraud, coercion, or collusion. Proponents must not engage in any unethical conduct, including lobbying, as described above, or other inappropriate communications; offering gifts to any employees, officers, agents, elected or appointed officials, or other representatives of ONTC; deceitfulness; submitting proposals containing misrepresentations or other misleading or inaccurate information; or any other conduct that compromises or may be seen to compromise the competitive process provided for in this RFP.

3.4.8 Supplier Suspension

ONTC may suspend a supplier from participating in its procurement processes for prescribed time periods based on past performance or based on inappropriate conduct, including, but not limited to, the following:

(a) illegal or unethical conduct as described above;
(b) the refusal of the supplier to honour its submitted pricing or other commitments;
(c) engaging in litigious conduct, bringing frivolous or vexatious claims in connection with ONTC's procurement processes or contracts, or engaging in conduct obstructive to a fair competitive process; or
(d) any conduct, situation, or circumstance determined by ONTC, in its sole and absolute discretion, to have constituted an undisclosed Conflict of Interest.

In advance of a decision to suspend a supplier, ONTC will notify the supplier of the grounds for the suspension and the supplier will have an opportunity to respond within a timeframe stated in the notice. Any response received from the supplier within that timeframe will be considered by ONTC in making its final decision.

3.5 Confidential Information

3.5.1 Confidential Information of ONTC

All information provided by or obtained from ONTC in any form in connection with this RFP either before or after the issuance of this RFP:

(a) is the sole property of ONTC and must be treated as confidential;
(b) is not to be used for any purpose other than replying to this RFP and the performance of the Agreement;
(c) must not be disclosed without prior written authorization from ONTC; and

(d) must be returned by the proponent to ONTC immediately upon the request of ONTC.

Each proponent shall be responsible for any breach of the provisions of this section by any person to whom it discloses ONTC confidential information.

3.5.2 Confidential Information of Proponent

A proponent should identify any information in its proposal or any accompanying documentation supplied in confidence for which confidentiality is to be maintained by ONTC. The confidentiality of such information will be maintained by ONTC, except as otherwise required by law or by order of a court or tribunal. Proponents are advised that their proposals will, as necessary, be disclosed on a confidential basis to advisers retained by ONTC to advise or assist with the RFP process, including the evaluation of proposals. If a proponent has any questions about the collection and use of personal information pursuant to this RFP, questions are to be submitted to the RFP Contact.

3.6 Reserved Rights and Limitation of Liability

3.6.1 Reserved Rights of ONTC

ONTC reserves the right to:

(a) make public the names of any or all proponents;
(b) make changes, including substantial changes, to this RFP provided that those changes are issued by way of addendum in the manner set out in this RFP;
(c) request written verification or clarification from any proponent and incorporate a proponent's response to that request for clarification into the proponent's proposal;
(d) assess a proponent's proposal on the basis of: (i) a financial analysis determining the actual cost of the proposal when considering factors including quality, service, price, and transition costs arising from the replacement of existing goods, services, practices, methodologies, and infrastructure (howsoever originally established); and (ii) in addition to any other evaluation criteria or considerations set out in this RFP, consider any other relevant information that arises during this RFP process;
(e) reject a proposal that contains abnormally low or unbalanced pricing;
(f) waive formalities and accept proposals that substantially comply with the requirements of this RFP;
(g) verify with any proponent or with a third party any information set out in a proposal;
(h) check references other than those provided by any proponent;
(i) disqualify a proponent, rescind a notice of selection, or terminate a contract subsequently entered into if the proponent has engaged in any conduct that breaches the process rules or otherwise compromises or may be seen to compromise the competitive process;
(j) select a proponent other than the proponent whose proposal reflects the lowest cost to ONTC;
(k) cancel this RFP process at any stage;
(l) cancel this RFP process at any stage and issue a new RFP for the same or similar deliverables;
(m) accept any proposal in whole or in part; or
(n) reject any or all proposals;

and these reserved rights are in addition to any other express rights or any other rights that may be implied in the circumstances.

3.6.2 Limitation of Liability

By submitting a proposal, each proponent agrees that

(a) neither ONTC nor any of its employees, officers, agents, elected or appointed officials, advisors, or representatives will be liable, under any circumstances, for any claim arising out of this RFP process including, but not limited to, costs of preparation of the proposal, loss of profits, loss of opportunity, or for any other claim; and
(b) the proponent waives any right to or claim for any compensation of any kind whatsoever, including claims for costs of preparation of the proposal, loss of profit, or loss of opportunity by reason of ONTC's decision to not accept the proposal submitted by the proponent, to enter into an agreement with any other proponent, or to cancel this RFP process, and the proponent shall be deemed to have agreed to waive such right or claim.

3.7 Governing Law and Interpretation

These Terms and Conditions of the RFP Process (Part 3):

(a) are intended to be interpreted broadly and independently (with no particular provision intended to limit the scope of any other provision);
(b) are non-exhaustive and shall not be construed as intending to limit the pre-existing rights of ONTC; and
(c) are to be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein and the courts of the Province of Ontario shall have exclusive jurisdiction to entertain any action or proceeding based on, relating to or arising from this RFP.

3.8 Power of Legislative Assembly

No provision of this RFP is intended to operate, nor shall any such provision have the effect of operating, in any way, that would interfere with or otherwise fetter the discretion of the Legislative Assembly of Ontario in the exercise of its legislative powers.

[End of Part 3]

APPENDIX A - FORM OF AGREEMENT

The Agreement for Deliverables will be the CCDC 2-2020 Supplementary Conditions and the Special Supplementary Condition CCDC 2 - Design Services, form of Agreement, as attached to this Appendix A.

ONTARIO NORTHLAND - SUPPLEMENTARY CONDITIONS – CCDC 2 – 2020 – REVISED 20 FEB 2026

AMENDMENTS TO THE AGREEMENT BETWEEN OWNER AND CONTRACTOR

1. ARTICLE A-1 THE WORK

1.1 In paragraph 1.1, delete the words "and for which" and "is acting as and hereinafter called the "*Consultant*"".

1.2 Delete paragraph 1.3 in its entirety and replace it with the following:

"1.3 commence the *Work* by the __ day of _____ in the year 20__ and, subject to adjustment in *Contract Time* as provided for in the *Contract Documents,* attain *Substantial Performance of the Work* by the __ day of _____ in the year 20__, and attain *Ready-for-Takeover* by the 30th day of September in the year 2027."

2. ARTICLE A-4 CONTRACT PRICE

2.1 Delete paragraph 4.4 and replace it with the following:

"The *Contract Price* shall remain fixed for the duration of the *Contract Time*, subject only to adjustments as provided for in the *Contract Documents*. For certainty, the *Contractor* assumes all risks in connection with cost increases for *Products*, labour, and *Construction Equipment* prescribed by the *Contract Documents* for the performance of the *Work*, and the *Contractor* assumes all responsibility for liabilities and additional costs that may arise as a result of the *Contractor*'s inclusion of any *Product*, *Construction Equipment*, *Supplier*, or *Subcontractor* in its calculation of the *Contract Price*."

3. ARTICLE A-5 PAYMENT

3.1 Delete paragraph 5.1 in its entirety, including all subparagraphs thereunder and replace it with the following:

"5.1 Subject to the provisions of the *Contract Documents* and the *Construction Act*, the *Owner* shall:

.1 make progress payments to the *Contractor* on account of the *Contract Price* when due together with such *Value Added Taxes* as may be applicable to such payments,

.2 upon *Substantial Performance of the Work*, as jointly certified by the *Owner* and the *Contractor*, and upon the expiry of the holdback period that follows the publication of the certificate of *Substantial Performance of the Work*, as stipulated in the *Construction Act*, there being no claims for lien registered against the title to the *Place of the Work* and no written notices of lien delivered to the *Owner*, pay the *Contractor* the unpaid balance of the holdback, together with such *Value Added Taxes* as may be applicable to such payment, less any amount stated in any Notice of Non-Payment that is published by the *Owner* in accordance with the *Construction Act*, and

.3 after *Ready-for-Takeover* has been achieved in accordance with the *Contract Documents* and the *Work* is complete, there being no claims for lien registered against the title to the *Place of the Work* and no written notices of lien delivered to the *Owner*, pay the *Contractor* the unpaid balance of the *Contract Price* in accordance with GC 5.5. – FINAL PAYMENT, together with such *Value Added Taxes* as may be applicable to such payment."

3.2 Delete paragraph 5.2, including all subparagraphs thereunder in its entirety and replace it with the following:

"5.2 Interest on late payments, if any, will be in accordance with the *Construction Act*."

4. ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING

4.1 Delete the text of ARTICLE A-6 RECEIPT OF AND ADDRESSES FOR NOTICES IN WRITING (retaining the provisions setting out the addresses of the Owner, Contractor and Consultant) and replace it with the following:

"6.1 *Notices in Writing* between the parties or between them shall be considered to have been received by the addressee on the date of receipt if delivered by hand or by commercial courier during normal business hours or if sent during normal business hours by e-mail during the transmission of which no indication of failure of receipt is communicated to the sender, and addressed as set out below. Such *Notices in Writing*

will be deemed to be received by the addressee on the next *Working Day* if sent by e-mail after normal business hours or if sent by overnight commercial courier. Such *Notices in Writing* will be deemed to be received by the addressee on the fifth *Working Day* following the date of mailing, if sent by pre-paid registered post, when addressed as set out below. An address for a party may be changed by *Notice in Writing* to the other party setting out the new address in accordance with this article."

5. ARTICLE A-9 CONFLICT OF INTEREST

5.1 Add new Article A-9 as follows:

"**ARTICLE A-9 CONFLICT OF INTEREST**

9.1 The *Contractor*, all of the *Subcontractors,* and any of their respective advisors, partners, directors, officers, employees, agents, and volunteers shall not engage in any activity or provide any services where such activity or the provision of such services creates a *Conflict of Interest* (actually or potentially, in the sole opinion of the *Owner*) with the provision of the *Work* pursuant to the *Contract*.

9.2 The *Contractor* shall disclose to the *Owner*, in writing, without delay, any actual or potential situation that may be reasonably interpreted as either a *Conflict of Interest* or a potential *Conflict of Interest*, including the retention of any *Subcontractor* or *Supplier* that is directly or indirectly affiliated with or related to the *Contractor*."

6. ARTICLE A-10 TIME OF THE ESSENCE / LIQUIDATED DAMAGES

6.1 Add new Article A-10 as follows:

"**ARTICLE A-10 TIME OF THE ESSENCE/LIQUIDATED DAMAGES** as follows:

10.1 It is agreed that one of the reasons the *Contractor* was selected by the *Owner* for this *Contract* is the *Contractor*'s representation and warranty that it will attain *Substantial Performance of the Work* and *Ready-for-Takeover* within the *Contract Time* stated in Article A-1.3 of this *Contract.* The *Contractor* acknowledges that it has been advised by the *Owner* that it is critical to the *Owner* that *Substantial Performance of the Work* and *Ready-for-Takeover* is achieved within the *Contract Time*. The *Contractor* agrees that time is of the essence in the performance of the *Contractor*'s obligations under this *Contract*.

10.2 The *Contractor* further acknowledges its understanding that the *Owner* is responsible and must account to the Government of Ontario, its customers and passengers and the residents of Northern Ontario. A failure by the *Contractor* to attain *Substantial Performance of the Work* and *Ready-for-Takeover* within the *Contract Time* will result in damages to the *Owner* and to the Government of Ontario, its customers and passengers and the residents and businesses in Northern Ontario, which would be difficult or impractical to quantify but would nevertheless have a significant negative impact on the *Owner* and its ability to provide the services the *Owner* is obliged to provide to the residents and businesses in Northern Ontario.

10.3 Given the significance of the requirement for the *Contractor* to achieve *Substantial Performance of the Work* and *Ready-for-Takeover*, as described in Article A-10.2, the *Contractor* further acknowledges and agrees that, without limiting the *Owner*'s entitlement to any additional or other damages, if it fails to achieve *Substantial Performance of the Work* and *Ready-for-Takeover* within the *Contract Time*, the *Owner* will incur substantial damages and the extent of such damages shall be incapable or very difficult of accurate measurement. Nonetheless, the parties acknowledge that as of the effective date of this *Contract*, the amount of liquidated damages set forth in subparagraph 10.4 below represents a good faith estimate on the part of the parties as to the actual potential damages that the *Owner* would suffer because of late completion of the *Project*. It is expressly acknowledged and agreed by and between the parties that the amount of such liquidated damages does not include any penalty. Notwithstanding the foregoing, where the *Project* is delayed beyond the *Contract Time*, the *Owner* shall be entitled to (i) the liquidated damages as calculated pursuant to Article A-10.4, or (ii) in the event that the *Contractor* claims that this liquidated damages provision is invalid or unenforceable and the *Contractor* prevails on such a defence, the damages arising from the delay suffered by the *Owner* including, without limitation, consequential, special, incidental, and indirect damages, costs and other expenses incurred or suffered by the *Owner*.

10.4 The *Owner* shall require that the *Contractor* pay to the *Owner* (or have deducted from Contract payments) liquidated damages at the per diem rate set out in the *Contract Documents* for each calendar day of delay beyond the prescribed date for *Ready-for-Takeover* until *Ready-for-Takeover* is achieved and certified, pursuant to the terms of the *Contract*. If there is no per diem rate set out in the *Contract Documents*, the *Contractor* shall pay to the *Owner* the *Administration Costs* incurred by the *Owner* as a result of the delay.

10.5 Liquidated damages will be assessed as incurred and reflected as deductions from amounts that may be due under any applications for payment pending at the time that such liquidated damages are assessed. All liquidated damages not deducted from payments prior to final payment shall be deducted from the final payment to be made by the *Owner* to the *Contractor* pursuant to GC 5.5 FINAL PAYMENT and any amount of liquidated damages in excess of the final payment amount, shall be paid by the *Contractor* to the *Owner*, within 30 days following a written demand by the *Owner* for such payment.

10.6 The liquidated damages payable under this paragraph are in addition to and without prejudice to any other remedy, action or any other alternative claim that may be available to the *Owner*."

AMENDMENTS TO THE DEFINITIONS

7. DEFINITIONS

7.1 Add the following new definitions:

Acceptance and *Accepted* means the *Owner* and the *Consultant* acknowledges that the work for a *Submittal* has been completed and that the *Submittal* on its face conforms to the requirements of the *Contract Documents*. *Acceptance* does not mean confirmation by the *Owner* or the *Consultant* that the *Submittal* does not contain errors or omissions, defects, deficiencies or deviations from the *Contract Documents.* Wherever the words "acceptance" and "accepted" are used in the *Contract Documents*, they shall have the meaning set out in this definition even if the words are not capitalized.

Administration Costs means those costs and expenses incurred by the *Owner* as a result of carrying out a process or activity due to a delay in the performance of the *Work* by the *Contractor* and include:

(a) additional fees payable by the *Owner* to the *Consultant* on a per diem basis according to the *Consultant*'s personnel rates;

(b) the *Owner*'s personnel costs associated with the delay, in an amount solely determined by the *Owner*; and

(c) any additional costs or loss of revenue incurred by the *Owner* due to the delay."

Adjudication means construction dispute interim adjudication as defined under the *Construction Act*.

The *Arbitration Act* means the *Arbitration Act*, 1991, S.O. 1991, c. 17, as amended.

As-Built Drawings means a set of drawings that are marked-up during construction by the *Contractor* that show how the structures and other parts of the *Work* were actually constructed versus how the structures and other parts of the *Work* were originally designed and "*As-Built Record Drawings*" means the *As-Built Drawings* prepared by the *Contractor* following completion of the *Work* that are *Submitted* to the *Owner* with the *Close-Out Documentation.*

Authority Having Jurisdiction means the federal, provincial or municipal entity that is responsible for enforcing codes, standards and regulations relating to building construction, has the power to pass regulations to direct, specify and govern elements or activities of construction projects such as codes, safety, health or standards of manufacture or installation.

Close-out Documentation has the meaning given in GC 5.5.1.2.

Confidential Information means all information of the *Owner* that is confidential by its nature or in the circumstances in which it is received, including without limitation *Personal Information* and all confidential information in the custody or control of the *Contractor*, regardless of whether it is identified as confidential or not,

which comes into the knowledge, possession or control of the *Contractor* in connection with this *Contract*, but *Confidential Information* does not include information that:

.1 is or becomes generally available to the public without fault or breach by the *Contractor*, but only after that information becomes generally available to the public;

.2 the *Contractor* can demonstrate to have been rightfully obtained by the *Contractor* without any obligation of confidence 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*, free of any obligation of confidence, when disclosed; or

.4 is independently developed by the *Contractor* without the use of any of the *Owner*'s *Confidential Information*.

Conflict of Interest includes, but is not limited to, any situation or circumstance where the interests, conduct, other commitments or relationships of a *Contractor*, a *Contractor*'s family member or an officer, director or employee of the *Contractor* could or could be perceived to, directly or indirectly, compromise, impair or be in conflict with the interests of the *Owner*.

Construction Act means the *Construction Act*, R.S.O. 1990, c. C.30, as amended, including all regulations passed under it that are enforceable as of the date of execution of this *Contract*. For certainty, the first procurement process for the *Project* (i.e., the "improvement" as that term is defined in the *Construction Act*) was commenced on or after October 1, 2019 and Parts I.1 (Prompt Payment) and II.1 (Construction Dispute Interim Adjudication) of the *Construction Act* apply to this *Contract.*

The *Construction Schedule* or construction schedule means the schedule for the performance of the *Work Submitted* by the *Contractor* and *Accepted* by the *Owner* pursuant to GC 3.4 – CONSTRUCTION SCHEDULE, including any amendments to the *Construction Schedule* made pursuant to the *Contract Documents*.

A *Dispute* means all unresolved claims, disputes or controversies of any kind arising out of or in connection with this *Contract* or the carrying out of the *Work*.

Environmental Contaminants means any substance, material or waste defined, regulated, listed or prohibited by *Environmental Laws*.

Environmental Laws means all applicable federal, provincial, territorial, municipal and local laws, statutes, ordinances, by-laws and regulations, judgments, decrees, common laws and principles thereof, and orders, directives and decisions rendered or issued by any *Authority Having Jurisdiction* relating to *Environmental Contaminants* or the protection of human health, natural resources or the environment.

Estimate means a calculation of the quantity or cost of the *Work* or part of it depending on the context.

Excess Soil means "excess soil" as that term is defined under section 3 of the *Excess Soil Regulation*.

Excess Soil Regulation means O. Reg. 406/19: On-Site and Excess Soil Management to the *Environmental Protection Act*, R.S.O. 1990, c. E.19., as amended.

Extended Warranty means the extended warranties described in the *Specifications* and *Extended Warranty Period* means the period or periods described in the *Specifications*;

Force Majeure means an event or a cause beyond the control of a party, which may include war, interference by civil or military authorities, civil insurrection, local or national emergency, blockade, seizure, riot, sabotage, vandalism, terrorism, earthquake, flood, act of God, accident, fire, nuclear or other explosion, disease, epidemic, pandemic, quarantine restriction, strike, lockout or other labour disturbance, governmental embargo, or changes to any acts, orders, legislation, regulations, directives, or priorities of any government or *Authority Having Jurisdiction*; provided such event is not caused by the affected party's negligence, default, failure to exercise reasonable diligence, bankruptcy or insolvency. A *Force Majeur*e event or cause does not include an inability to pay or a lack of financial resources unless it is due to a failure of the province to approve the appropriation from the Consolidated Revenue Fund for the *Project*.

Impact Assessment Reports means the impact assessment reports, if any, listed in the *RFP* related to the *Fisheries Act*; *Navigable Waters Act*; *Lakes and Rivers Improvement Act*; heritage reviews; *Endangered Species Act* and *Species at Risk Act*; terrestrial resources (vegetation, wildlife, other features); socio-economic impacts and Indigenous consultations.

Intellectual Property means any improvement, invention or discovery, whether or not patented or patentable, any technical data, know-how or trade secret, any design, any computer software or any work subject to copyright, whether or not such design or copyright is registered or registrable and all Intellectual Property Rights contained, embedded or disclosed in the *Work*.

Notice of Non-Payment means a notice of non-payment (Form 1.1) under the *Construction Act*.

Payment Period or payment period means the fixed segments of time for which the *Contractor* shall be entitled to claim payment for *Work* performed during such period, as agreed upon by the *Owner* and the *Contractor* at the first pre-construction meeting. To be effective, such agreement must be in writing or reflected in the final and approved pre-construction meeting minutes. In the event that the *Owner* and the *Contractor* do not fix the segment of time for each *Payment Period* at the first pre-construction meeting, then each *Payment Period* shall be a one (1) month period during which *Work* was performed, with the start and end dates of each *Payment Period* deemed to be the first (1st) calendar day of the applicable month and the last calendar day of the same month, respectively."

Personal Information means information that relates to an identifiable individual or that identifies or may identify an individual as defined in section 2 of the *Freedom of Information and Protection of Privacy Act,* R.S.O. 1990, *c.* F.31, as amended.

Pre-Invoice Submission Meeting has the definition given to it under GC 5.2.1.

Proper Invoice means a "proper invoice" as that term is defined in Section 6.1 of the *Construction Act* that complies with the minimum requirements set out in Schedule A to the Supplementary Conditions.

Proper Invoice Submission Date is the dated referenced in GC 5.2.2.

Restricted Period (Adjudication) means the (inclusive) period of time between November 15 in one calendar year to January 2 in the next calendar year, in any given year throughout the duration of the *Contract*.

Restricted Period (Proper Invoice) means the (inclusive) period of time between December 10 to December 28 in any given year throughout the duration of the *Contract*.

RFP means the procurement documents used by the *Owner* for the procurement of the *Contractor* for the *Project*.

Statutory Declaration means the "Ontario Northland Statutory Declaration of Progress Payment Distribution by Contractor" form, attached to the Supplementary Conditions as Schedule "B".

Submittal(s) means all documentation prepared by the *Contractor* and submitted to the *Owner* and/or the *Consultant* for review and *Acceptance* in accordance with the *Contract Documents*.

Third-Party Property Owner means the owner, tenant or other person having the right to use a property.

Warranty Period means the period during which the *Contractor* provides a warranty for the *Work* described in GC 12.3.

Waste Management Plan means the plan to be submitted by the *Contractor* to the *Owner* and the *Consultant* described in GC 3.11.1 and *Waste Management Report* has the meaning described in the *Specifications*."

7.2 Delete the definition of "*Consultant*" and replace it with the following:

"The *Consultant* is the *Owner*'s project manager designated by the *Owner* to be the *Owner*'s representative for the purposes of the *Contract*. All references to the *Consultant* in the *Contract Documents* shall mean the *Owner* and, unless otherwise provided in the *Contract Documents*, any requirement for a decision or opinion, in writing

or otherwise, by the *Consultant* shall mean a decision of the *Owner*. References to the "Engineer" in the *Specifications* or to the "Contract Administrator" in OPSS shall mean the *Consultant* as defined herein."

7.3 At the end of the definition of "*Drawings*", add the following words "and a Waste Management Plan".

7.4 Delete the definition of "*Contract Price*" and replace it with the following:

"*Contract Price* is the amount payable by the *Owner* to the *Contractor* for *Work* to be completed under the *Contract* in accordance with the method and manner of payment stipulated in the *Contract Documents* and the lump sum price submitted by the *Contractor* in its proposal as stipulated in Article A-4.1 as amended by any *Change Orders*."

7.5 Delete the definition of *Payment Legislation*.

7.6 Amend the definition of *Ready-for-Takeover* by deleting all the words after "as verified" and replacing them with "and *Accepted* by the *Owner*."

AMENDMENTS TO THE GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

8. GC 1.1 CONTRACT DOCUMENTS

8.1 Where a General Condition or paragraph of the General Conditions of the Stipulated Price Contract is 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.

8.2 Delete paragraph 1.1.3 and replace it with the following:

"1.1.3 "The *Contractor* shall review the *Contract Documents* and shall report promptly to the *Owner* any error, inconsistency or omission the *Contractor* may discover. Such review by the *Contractor* shall comply with the standard of care described in paragraph 3.12.1 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 *Owner* for the accuracy of the *Contract Documents*. Provided it has exercised the degree of care and skill described in this paragraph 1.1.3, 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. If the *Contractor* does discover any error, inconsistency or omission in the *Contract Documents*, the *Contractor* shall immediately notify the *Owner* and shall not proceed with the work affected until the *Contractor* has received corrected or missing information from the *Owner*. If the *Contractor* finds discrepancies in and/or omissions from the *Contract Documents* or has any doubt as to the meaning or intent of any part thereof, the *Contractor* must immediately notify the *Owner* by means of a written Request for Information ("RFI") and the *Consultant* will provide written instructions or explanations. The *Owner* shall not be responsible for oral instructions."

8.3 Delete paragraph 1.1.4 and replace it with the following:

"1.1.4 Notwithstanding the foregoing, errors, inconsistencies and/or omissions shall not include lack of reference on the *Drawings* or in the *Specifications* to labour and/or *Products* that are required or normally recognized within respective trade practices as being necessary for the complete execution of the *Work*. The Contractor shall not use RFIs, issued during execution of the *Work*, in and of themselves to establish a change and/or changes in the *Work* pursuant to Part 6 – CHANGES IN THE WORK. In the event an RFI or the cumulative effect of RFIs leads to what the *Contractor* considers to be a change in the *Work*, then the procedure under Part 6 – CHANGES IN THE WORK shall be followed."

8.4 Delete paragraph 1.1.5.1 in its entirety and replace it with new 1.1.5.1:

"the order of priority of documents, from highest to lowest, shall be:

- Special Provisions, if any
- ONTC Special Supplementary Conditions, if any
- ONTC Supplementary Conditions to CCDC 2
- Agreement between the Owner and the Contractor
- Definitions
- General Conditions
- Addenda to the Request for Proposals ("RFP")

- Appendix B to the RFP – RFP Particulars
- Appendix G to the RFP – Technical Specifications
- Appendix H to the RFP – Shop Drawings
- Appendix I to the RFP – Reference Reports
- Appendix J to the RFP – Photographs
- Appendix K to the RFP – Policies and Procedures
- Contractor's Proposal, including Appendices C, D, E, and F"

8.5 Add a new subparagraph 1.1.5.6 as follows:

".6 Schedules of Division 01 - General Requirements of the Specifications shall form part of and be read in conjunction with the technical specification section."

8.6 Add a new sentence to the end of paragraph 1.1.9 as follows:

"The *Specifications* are divided into divisions and sections for convenience but shall be read as a whole and neither such division nor anything else contained in the *Contract Documents* will be construed to place responsibility on the *Owner* to settle *Disputes* among the *Subcontractors* and *Suppliers* in respect to such divisions."

8.7 Delete paragraph 1.1.10 in its entirety and replace it with new paragraph 1.1.10:

"All *Submittals* and *Intellectual Property* rights produced by or resulting from the *Work*, including all *Specifications, Drawings*, models and copies thereof, shall vest in the *Owner* and are the sole and absolute property of the *Owner* as and when created. The *Contractor* hereby irrevocably assigns and conveys and agrees to assign and convey, without further consideration, all right, title and interest in and to the *Intellectual Property* rights produced or resulting from the Work, in perpetuity and throughout the world, to the *Owner* and its successors and assigns. This paragraph 1.1.10 shall survive termination of the *Contract*."

8.8 Add new paragraphs 1.1.12, 1.1.13, 1.1.14, 1.1.15, 1.1.16 and 1.1.17 as follows:

"1.1.12 The *Owner* shall provide the *Contractor*, without charge, an electronic version of the *Contract Documents*."

1.1.13 If an item is shown on one document, and it can be reasonably inferred that it was intended to include work not shown on other related documents, the *Contract Price* shall nevertheless include for the cost of the item of work, unless the *Owner* agrees otherwise.

1.1.14 Where a provision in the *Contract* is made for the giving or issuing of any *Notice in Writing*, consent, Acceptance, approval, certificate or determination by any person, unless otherwise specified such *Notice in Writing*, consent, *Acceptance*, approval, certificate or determination shall be in writing and shall not unreasonably be withheld or delayed.

1.1.15 The *Contractor* shall keep one copy of the current *Contract Documents*, *Supplemental Instructions*, contemplated change orders, *Change Orders*, *Change Directives*, reviewed *Shop Drawings*, reports and records of meetings at the *Place of Work* in good order and available to the *Owner*.

1.1.16 The *Contractor* shall keep one copy of current standards and manufacturers' literature specified in the *Contract Documents* at the *Place of Work* in good order and available to the *Owner* for the duration of the *Work*.

1.1.17 The *Drawings* are, in part, diagrammatic and are intended to convey the scope of the *Work* and indicate general and appropriate locations, arrangement and sizes of materials. The *Contractor* shall obtain more accurate information about the locations, arrangement and sizes from study and coordination of the *Drawings* and shall become familiar with conditions and spaces affecting these matters before proceeding with the *Work*. Where site conditions require minor changes in indicated locations and arrangements, the *Contractor* shall make such changes at no additional cost to the *Owner*."

9. GC 1.2 LAW OF THE CONTRACT

9.1 Delete paragraph 1.2.1 in its entirety and replace it with new paragraph 1.2.1:

"This *Contract* shall be governed by and constituted in accordance with the laws in force in the Province of Ontario excluding any conflict of laws principles. The parties hereby irrevocably attorn to the exclusive jurisdiction of the courts of the Province of Ontario for any legal proceedings arising out of this *Contract* or the performance of the obligations hereunder."

10. GC 1.4 ASSIGNMENT

10.1 Delete paragraph 1.4.1 in its entirety and replace it with new paragraph 1.4.1:

"Neither party to the *Contract* shall assign the *Contract* or a portion thereof without the written consent of the other, which consent, in the case of the *Owner*, is at the sole discretion of the *Owner*. In the event of an assignment of the *Contract* by the *Contractor*, such assignment shall require prior written consent of the *Owner* and shall not relieve the *Contractor* from its obligations and liabilities hereunder."

11. GC 2.1 AUTHORITY OF THE CONSULTANT

11.1 Delete paragraph 2.1.1 in its entirety and replace it with the following:

"2.1.1 The *Owner*'s project manager shall have the authority to act on behalf of the *Owner* for all matters arising under the *Contract*."

11.2 Delete paragraph 2.2.2 in its entirety.

12. GC 2.2 ROLE OF THE CONSULTANT

12.1 Delete paragraph 2.2.3 in its entirety.

12.2 Delete paragraph 2.2.4 in its entirety.

12.3 Delete paragraph 2.2.6 in its entirety and replace it with the following:

"2.2.6 If there is a *Dispute* between the *Owner* and the *Contractor* regarding the performance of the *Work* or the interpretation of the *Contract Documents*, the parties shall resolve the *Dispute* in accordance with PART 8 – DISPUTE RESOLUTION."

12.4 Delete paragraph 2.2.7 in its entirety.

12.5 Delete paragraph 2.2.8 in its entirety.

12.6 Delete paragraph 2.2.9 in its entirety.

12.7 Delete paragraph 2.2.10 in its entirety.

12.8 Amend paragraph 2.2.12 by adding the following to the end of that paragraph:

"The *Supplemental Instructions* are not a change in the *Contract Documents*. If, in the opinion of the *Contractor*, the *Supplemental Instruction* requires an adjustment in the *Contract Price* or in the *Contract Time*, it shall, within three (3) *Working Days* after receipt of a *Supplemental Instruction* provide the *Consultant* and the *Owner* with *Notice in Writing* to that effect. Failure to provide *Notice in Writing* within the time stipulated in this paragraph 2.2.12 shall be deemed an acceptance of the *Supplemental Instruction* by the *Contractor* without adjustment in the *Contract Price* or *Contract Time*."

12.9 Delete paragraph 2.2.18 in its entirety.

13. GC 2.3 REVIEW AND INSPECTION OF THE WORK

13.1 Add new paragraph 2.3.8 as follows:

"Where inspection and testing services are specified, the service provider employed for such services shall be the service provider named by the *Owner*."

13.2 Add new paragraph 2.3.9 as follows:

"Where standards of performance are specified and the *Work* does not comply with the specified standard of performance, the deficiency in the *Work* shall be corrected as directed by the *Consultant*. Subsequent testing to ensure that the standard of performance has been attained (including re-testing by *Owner*), shall be carried out at the *Contractor*'s expense and shall not be paid from the cash allowances described in GC 4.1."

14. GC 2.4 DEFECTIVE WORK

14.1 Add new paragraphs 2.4.1.1, 2.4.1.2, 2.4.1.3 and 2.4.1.4 as follows:

".1 Without limiting the foregoing, the *Contractor* shall rectify, in a manner acceptable to the *Owner*, all defective work and deficiencies throughout the *Work*, whether or not they are specifically identified by the *Owner*.

.2 The *Contractor* shall prioritize the correction of any *Defective* work which, in the sole discretion of the *Owner*, adversely affects the day to day operations of the *Owner*.

.3 All such corrections of defective work and deficiencies shall be at the *Contractor*'s expense.

.4 If the *Contractor* fails to do the work to correct the defective *Work* or deficiencies, the *Owner* may carry out such remediation work by its own forces or by other *Contractors* and the *Owner* shall be entitled to recover from the *Contractor* the costs thereof or may deduct the same from any monies due or that become due to the *Contractor*."

14.2 Amend paragraph 2.4.3 by deleting the last sentence and replacing it with the following:

"If the *Owner* and the *Contractor* do not agree in the difference in value, they shall resolve the disagreement pursuant to Part 8 – DISPUTE RESOLUTION."

14.3 Add new paragraph 2.4.4 as follows:

"2.4.4 Neither the *Acceptance* of the *Work* by the *Owner*, nor any failure by the *Owner* to identify, observe or warn of defective *Work* or any deficiency in the *Work* shall relieve the *Contractor* from the sole responsibility for rectifying such defect or deficiency at the *Contractor's* sole cost, even where such failure to identify, observe or warn is negligent."

15. GC 2.5 EMERGENCY SITUATIONS

15.1 Add new GC 2.5 EMERGENCY SITUATIONS as follows:

".1 The *Owner* has the right to determine the existence of an emergency situation and, when such an emergency situation is deemed to exist, the *Owner* may instruct the *Contractor* to take action to remedy the situation. If the *Contractor* does not take timely action or, if the *Contractor* is not available, the *Owner* may direct others to remedy the situation. Any such action or direction taken by the *Owner* shall not relieve the *Contractor* of its responsibilities as the "Constructor" pursuant to the *Occupational Health and Safety Act* (Ontario).

.2 If the emergency situation was the fault of the *Contractor*, the remedial work shall be completed at the cost of the *Contractor* and with no additional cost to the *Owner* and the *Owner* shall be entitled to seek reimbursements for all costs associated with the remedial work including the cost of work done by third parties.

.3 If the emergency situation was not the fault of the *Contractor*, the *Owner* shall pay for the remedial work."

16. GC 3.1 CONTROL OF THE WORK

16.1 Add new paragraph 3.1.3 as follows:

"Prior to commencing individual procurement, fabrication and construction activities, the *Contractor* shall verify, at the *Place of the Work*, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the *Work* and shall further carefully compare such field measurements and conditions with the requirements of the *Contract Documents*. Where dimensions are not included or exact locations are not

apparent, the *Contractor* shall immediately notify the *Owner* in writing and obtain written clarification from the *Owner* before proceeding with any part of the affected *Work*."

16.2 Add new paragraph 3.1.4 as follows:

"The *Contractor* shall perform the work in a good and workmanlike manner, using new materials, in accordance with all applicable laws and current best practices and standards in the construction industry at the *Place of Work*. The *Contractor* acknowledges that both time and quality are of the essence and the *Contractor* will perform the *Work* or cause the *Subcontractors* and *Suppliers* to perform the *Work* in accordance with the *Construction Schedule*, as amended from time to time, and in an expeditious and professional manner."

17. GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

17.1 Add new paragraph 3.2.3.5 as follows:

"Subject to GC 9.4 – CONSTRUCTION SAFETY, for the *Owner's* own forces and for *Other Contractors*, assume overall responsibility for compliance with all aspects of the applicable health and safety legislation of the *Place of the Work*, including all of the responsibilities of the "Constructor" under the *Occupational Health and Safety Act* (Ontario)."

18.2 Add new paragraph 3.2.3.6 as follows:

"provide for the co-ordination of the activities and work of *Other Contractors* and *Owner's* own forces with the *Work* of the *Contract.*"

18. GC 3.4 CONSTRUCTION SCHEDULE

18.1 Delete paragraph 3.4.1 in its entirety and replace it with the following:

"3.4.1 The *Contractor* shall:

.1 within 10 *Working Days* from the date of the *Contract* award, prepare for the *Owner*'s review and *Acceptance*, a construction schedule, including identification of the critical path of the *Work*, the schedule of operations, the proposed methods of construction and sequence of *Work*, and the time the *Contractor* proposes to complete the various items of *Work* within the *Contract Time*. The schedule shall be designed to ensure conformity with the *Contract Time*. The schedule will be in a Gannt chart format in either .pdf or excel format and include:

(a) activity sequences and durations;

(b) process for obtaining any required permits;

(c) work block planning and track protection requested;

(d) special allocation of labour and *Products*;

(e) processing of *Shop Drawings* and samples;

(f) delivery of *Products* involving long lead time procurement;

(g) usage and occupancy requirements of the *Owner* of those portions of the *Work* having usage or occupancy priority;

(h) *Substantial Performance of the Work*, and *Ready-for-Takeover* reflecting that such milestones will be achieved by no later than the dates specified in Article A-1.3; and

(i) any other schedule requirements set out in the *Contract Documents*.

If the construction schedule submitted by the *Contractor* is not *Accepted* by the *Owner*, the *Contractor* shall make revisions to the construction schedule until it is *Accepted* by the *Owner*. Once *Accepte*d by the *Owner*, the schedule submitted by the *Contracto*r shall become the

"*Construction Schedule*." Notwithstanding any other terms of this *Contact*, the *Contractor* shall not be entitled to receive any payment from the *Owner* until a construction schedule has been submitted by the *Contractor* and *Accepted* by the *Owner*. The *Owner* may, at its sole discretion, not issue an order to commence *Work* until the schedule has been received and *Accepted*.

.2 during performance of the *Work* and in accordance with the controls and reporting requirements in the *Contract Documents*, provide for the *Owner*'s review and *Acceptance*, progress reports updating the *Construction Schedule*, reporting on the progress achieved, percentage of completion, schedule status and financial status with areas of immediate concern highlighted. If the schedule is affected by approved *Change Orders*, the *Contractor* shall submit an updated *Construction Schedule*, if requested by the *Owner*, within 7 *Working Days* of the request. This updated schedule shall show how the *Contractor* proposes to perform the balance of the *Work*, so as to complete the *Work* within the *Contract Time*.

.3 provide progress reports with each application for payment, in the form provided by the *Owner* attached as Schedule C, for review and *Acceptance*, including an update of the *Construction Schedule* referred to in paragraph 3.4.1."

18.2 Add new paragraph 3.4.2 and 3.4.3 as follows:

"3.4.2 If,

.1 at any time it should reasonably appear to the *Owner* that the actual progress of the *Work* is behind schedule or is likely to become behind schedule, based on critical path methodology, and *Notice in Writing* of such opinion is given to the *Contractor*; or

.2 the *Contractor* becomes aware of or notices a slippage in the *Construction Schedule*,

then the *Contractor* shall take appropriate steps to cause the actual progress of the *Work* to conform to the *Construction Schedule* and shall produce and present to the *Owner* for its review and *Acceptance* within 5 *Working Days* after becoming aware of the schedule slippage a recovery plan demonstrating how the *Contractor* will achieve the recovery of the *Construction Schedule*.

3.4.3 The *Contractor* is responsible for performing the *Work* within the *Contract Time*. Any schedule submissions revised from the *Accepted* baseline *Construction Schedule* or *Accepted* revised *Construction Schedule* pursuant to GC 3.4 CONSTRUCTION SCHEDULE during construction are deemed NOT to be approved extensions to the *Contract Time.* Revisions to the *Construction Schedule* shall not be made without the prior written *Acceptance* of the *Owner*. All requests by the *Contractor* for a revision to the *Construction Schedule* that includes an extension to the *Contract Time* or adjustment to the date(s) for *Substantial Performance of the Work* or *Ready-for-Takeover* must be approved by the *Owner* through an executed *Change Order.*"

19. GC 3.5 SUPERVISION

19.1 Amend paragraph 3.5.1 by adding at the end of that paragraph:

"…, and upon the *Contractor* obtaining the *Owner*'s written consent, which consent will not be unreasonably withheld."

19.2 Add new paragraph 3.5.3 as follows:

"Notwithstanding paragraph 3.5.2, the representative of the *Contractor* attending a meeting with the *Owner* or the *Owner*'s representative shall be deemed to have authority to act on behalf of the *Contractor* and bind the *Contractor* in matters related to this *Contract*."

19.3 Add new paragraph 3.5.4 as follows:

"The *Owner* may, at any time during the course of the *Work*, request the replacement of the appointed *Contractor*'s representative(s), where the grounds for the request involve conduct on the part of the *Contractor*'s representative(s) which jeopardizes the safety of the *Owner*'s operations or the *Work* or the proper progress of the *Work*. Immediately upon receipt of the request, the *Contractor* shall make arrangements to appoint an *Acceptable* replacement. The *Contractor* shall indemnify and hold the *Owner* harmless from and against any

damages, costs, expenses, claims, injuries and other liabilities suffered by the *Owner* arising from the conduct of the representative that is being replaced."

20. GC 3.6 SUBCONTRACTORS AND SUPPLIERS

20.1 Add new paragraph 3.6.1.4:

"ensure the *Subcontractors* and *Suppliers*, while working on the *Owner*'s property, are aware of and comply with the *Owner*'s policies, including its Fit for Duty Policy, and with the Ontario Northland Operating Manual, including the Current Summary Bulletin, the current Ontario Northland Time Table, C.R.O.R. 2022, Infrastructure Special Instructions, Dangerous Goods and Ontario Northland General Operating Instructions, as applicable."

20.2 Delete paragraph 3.6.2 in its entirety and replace it with a new paragraph 3.6.2

"The *Contractor* shall not change *Subcontractors* or *Suppliers* identified in the *Contract Documents* without the prior written approval of the *Owner* which approval will not be unreasonably withheld.

20.3 Delete paragraphs 3.6.3 and 3.6.4 in their entirety and replace them with "Intentionally Left Blank."

21.4 Add new paragraph 3.6.7 as follows:

"The responsibility as to which *Supplier* and/or *Subcontractor* provides the specific labour, *Products* and services for each item of work rests solely with the *Contractor*, within and in accordance with the requirements and limitations listed in the *Contract Documents* with respect to approval of *Suppliers* and/or *Subcontractors* permitted to perform work on the *Project*."

21. GC 3.7 LABOUR AND PRODUCTS

21.1 Amend paragraph 3.7.1 by adding the words, "..., agents, *Subcontractors* and *Suppliers* …" after the word "employees".

21.2 Amend paragraph 3.7.2 by adding the following words at the beginning of the paragraph: "Except as otherwise provided in the technical *Specifications*" and adding the following sentence at the end of that paragraph:

"The *Contractor* represents and warrants that the *Products* supplied by the *Contractor* in accordance with the *Contract* are not subject to any conditional sales contract and are not subject to any security rights obtained by any third party which may subject any of the *Products* to seizure and/or removal from the *Place of the Work*."

21.3 Add new paragraph 3.7.4 as follows:

"Upon receipt of a *Notice in Writing* from the *Owner*, the *Contractor* shall take action to rectify any situation involving its employee, agent, *Subcontractor* or *Supplier* whose work is unsatisfactory to the *Owner* or who are considered by the *Owner* to be unskilled or otherwise objectionable. If after giving sufficient warning the *Contractor* is not able to reasonably rectify such situation, then such employee, agent, *Subcontractor* or *Supplier* shall be dismissed from the *Place of the Work* and the *Contractor* shall indemnify and hold the *Owner* harmless from and against any damages, costs, expenses, claims, injuries and other liabilities suffered by the *Owner* arising from the dismissal of such employee, agent, *Subcontractor* or *Supplier*."

21.4 Add new paragraph 3.7.5 as follows:

"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* identified by the *Contractor* and *Accepted* by of the *Owner*. The *Owner* shall provide all relevant information on the *Products* to be supplied by the *Owner* or *Other Contractors*."

21.5 Add new paragraph 3.7.6 as follows:

"The *Contractor* shall not employ any persons to perform *Work* whose labour affiliation, or lack thereof, is incompatible with other labour employed in connection with the *Work*. Any costs arising from labour disputes, as a result of the employ of any such person by the *Contractor*, its *Subcontractors* or *Suppliers* shall be at the sole expense of the *Contractor*."

21.6 Add new paragraph 3.7.7 as follows:

"The *Contractor* and the *Owner* and its representatives shall cooperate and shall take all reasonable and necessary actions to maintain stable and harmonious labour relations with respect to the work at the *Place of the Work*, including cooperation to attempt to avoid work stoppages, trade union jurisdictional disputes and other labour disputes."

22. GC 3.8 SHOP DRAWINGS

22.1 Delete paragraph 3.8.7 and replace it with the following:

"3.8.7 The *Owner* will review and return *Shop Drawings* in accordance with the schedule agreed upon as described in paragraph 3.8.2, or, in the absence of such schedule, with reasonable promptness. If, for any reason, the *Owner* cannot process them within the agreed-upon schedule or with reasonable promptness, the *Owner* shall notify the *Contractor* and they shall meet to review and develop a revised schedule for processing such *Shop Drawings* that is *Acceptable* to the *Owner*. The *Contractor* shall update the *Shop Drawings* schedule to correspond to changes in the *Construction Schedule*. Changes in the *Contract Price* or *Contract Time* may be made only in accordance with GC 6.1, GC 6.2 or GC 6.3."

22.2 Add new paragraphs 3.8.8, 3.8.9, 3.8.10 and 3.8.11 and as follows:

"3.8.9 The *Contractor* shall provide *Shop Drawings* and *Submittals* in the form specified, or if not specified, as directed by the *Owner*. *Shop Drawings* provided by the *Contractor* to the *Owner* shall indicate by stamp, date and signature of the person responsible for the review that the *Contractor* has reviewed each one of them. Certain *Specifications* sections require the *Shop Drawings* to bear the seal and signature of a professional engineer. Such professional engineer must be registered in the jurisdiction of the *Place of the Work* and shall have expertise in the area of practice reflected in the *Shop Drawings*.

3.8.10 *Shop Drawings* which require approval of any *Authority Having Jurisdiction* shall be provided to such authority by the *Contractor* for the authority's approval.

3.8.11 The *Contractor* shall provide revised *Shop Drawings* to correct those which the *Owner* rejects as inconsistent with the *Contract Documents*, unless otherwise directed by the *Owner*. The *Contractor* shall notify the *Owner* in writing of any revisions to the *Shop Drawings* other than those requested by the *Owner*.

3.8.12 Reviewed *Shop Drawings* shall not authorize a change in the *Contract Price* and/or the *Contract Time*."

23. GC 3.9 USE OF THE WORK

23.1 Add new GC 3.9 – USE OF THE WORK as follows:

"**GC 3.9 USE OF THE WORK**

3.9.1 The *Contractor* shall confine *Construction Equipment*, *Temporary Work*, storage of *Products*, waste products and debris, and operations of employees and *Subcontractors* to limits indicated by laws, ordinances, permits, or the *Contract Documents* and shall not unreasonably encumber the *Place of the Work*.

3.9.2 The *Contractor* shall not load or permit to be loaded any part of the *Work* with a weight or force that will endanger the safety of the *Work*.

3.9.3 The *Owner* shall have the right to enter or occupy the *Place of the Work* in whole or in part for the purpose of placing fittings and equipment, or for other use before *Ready-for-Takeover*, if, in the opinion of the *Owner*, such entry and occupation does not prevent or substantially interfere with the *Contractor* in the performance of the *Contract* within the *Contract Time*. Such entry or occupation shall neither be considered as acceptance of the *Work* or in any way relieves the *Contractor* from its responsibility to complete the *Contract*."

24. GC 3.10 CUTTING AND REMEDIAL WORK

24.1 Add new GC 3.10 – CUTTING AND REMEDIAL WORK as follows:

"**GC 3.10 CUTTING AND REMEDIAL WORK**

3.10.1 The *Contractor* shall perform the cutting and remedial work required to make the affected parts of the *Work* come together properly. Such cutting and remedial work shall be performed by specialists familiar with the *Products* affected and shall be performed in a manner to neither damage nor endanger the *Work*.

3.10.2 The *Contractor* shall coordinate the *Work* to ensure all cutting and remedial work required is kept to a minimum."

25. GC 3.11 CLEANUP

25.1 Add new GC 3.11 – CLEANUP as follows:

"**GC 3.11 CLEANUP**

3.11.1 The *Contractor* shall comply with all requirements for cleanup at the *Place of the Work* as specified in the *Contract Documents*. The *Contractor* shall provide to the *Owner* for *Acceptance* a *Waste Management Plan*, and a waste reduction plan if required by *Environmental Laws*, for the waste products, debris and any *Excess Soils* generated by the Work, which plan shall comply with all *Environmental Laws* and the *Specifications*. The costs of disposing of all waste products and debris, including products and debris containing *Environmental Contaminants*, and *Excess Soil* resulting from the *Work* is included in the *Contract Price*.

3.11.2 Before applying for *Substantial Performance of the Work*, the *Contractor* shall remove waste products and debris and shall leave the *Place of the Work* clean and suitable for use or occupancy by the *Owner*. All products, tools, *Construction Equipment* and *Temporary Work* not required for the performance of any remaining *Work* shall be removed by the *Contractor*.

3.11.3 As a condition precedent to final payment, the *Contractor* shall remove any remaining products, tools, *Construction Equipment*, *Temporary Work*, waste products and debris from the *Place of the Work* to the satisfaction of the *Owner*.

3.11.4 In performing work to correct deficiencies or work under warranty following *Ready-for-Takeover* of the *Work*, the *Contractor* shall maintain the *Place of the Work* in a tidy condition and shall immediately remove waste products and debris.

3.11.5 The *Contractor* shall comply with all *Environmental Laws* in disposing of the waste products, debris and *Excess Soil* resulting from the *Work*. The *Contractor* shall assume all liability and responsibility for any waste products, debris and *Excess Soil*, including any such materials containing *Environmental Contaminants*, which are removed from the *Place of the Work* by the *Contractor* and during the transportation of the waste products, debris and *Excess Soils* to the appropriate waste disposal site. The *Contractor* shall submit landfill weigh bills from a waste disposal site as proof that all waste has been disposed of at a certified waste disposal site. The *Contractor* shall submit a *Waste Management Report* as part of the *Close-Out Documentation* described in paragraph 5.5.1.2. to be submitted with the application for verification of *Ready-for-Takeover*.

3.11.6 In the event that the *Contractor* fails to remove waste and debris as provided in this GC 3.11, then the *Owner* may give the *Contractor* twenty-four (24) hours' *Notice in Writing* to meet its obligations respecting clean up. Should the *Contractor* fail to meet its obligations pursuant to this GC 3.11 within the twenty-four (24) hour period next following delivery of the notice, the *Owner* may remove such waste and debris and deduct from payments otherwise due to the *Contractor*, the *Owner*'s costs for such clean up, including a reasonable mark-up for *Administration Costs*."

26. GC 3.12 PERFORMANCE BY CONTRACTOR

26.1 Add new GC 3.12 – PERFORMANCE BY CONTRACTOR as follows:

"**GC 3.12 PERFORMANCE BY CONTRACTOR**

3.12.1 In performing its obligations, duties and responsibilities under this *Contract*, the *Contractor* shall exercise the degree of care, skill and diligence that would normally be exercised by an experienced, skilled and prudent contractor supplying similar services for similar projects. The *Contractor* acknowledges and

agrees that, throughout this *Contract*, the *Contractor*'s obligations, duties and responsibilities shall be judged, evaluated and interpreted in accordance with this standard. The *Contractor* shall exercise the same standard of care in respect of any *Products*, *Subcontractors*, *Suppliers*, personnel or procedures which it may recommend to the *Owner* or employ on the *Project*.

3.12.2 The *Contractor* further represents, covenants and warrants to the *Owner* that:

.1 The personnel and *Subcontractors* it assigns to the *Project* are appropriately experienced;

.2 It has a sufficient staff of qualified and competent personnel to replace its designated supervisor and project manager, 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."

3.12.3 The *Owner* has a Vendor Performance Policy which requires the *Owner* to complete an evaluation of the *Contractor*'s performance of its obligations under this *Contract*. The performance evaluation of the *Contractor* for the supply of the *Work* will be used in the assessment of the *Contractor*'s proposals in response to future procurements. The performance evaluation may also result in the *Contractor* being disqualified from submitting proposals in response to future procurements in accordance with the terms of the policy. The policy can be found at http://ontarionorthland.ca/en/requests-tenders."

27. 3.13 EXCESS SOIL MANAGEMENT

27.1 Add new GC 3.13 – EXCESS SOIL MANAGEMENT as follows:

"**GC 3.13 EXCESS SOIL MANAGEMENT**

3.13.1 The *Contractor* shall be solely responsible for the proper management of all *Excess Soil* at the *Place of the Work* and for performance of the *Work* in compliance with the rules, regulations and practices required by the *Excess Soil Regulation* until such time as *Ready-for-Takeover* is achieved. Without restricting the generality of the previous sentence, the *Contractor's* responsibility under this GC 3.13 includes the testing, designation, transportation, tracking, temporary and/or final placement, record keeping, and reporting of all *Excess Soil* in connection with the *Work* all in compliance with the *Excess Soil Regulation.*

3.13.2 The *Contractor* shall indemnify and save harmless the *Owner*, their agents, officers, directors, administrators, governors, employees, consultants, successors and assigns from and against the consequences of any and all infractions committed by the *Contractor,* or those for whom it is responsible at law, under the *Excess Soil Regulation*, or any environmental protection legislation, including the payment of legal fees and disbursements on a substantial indemnity basis."

27A GC 4.1 CASH ALLOWANCES

27A.1 Add the following at the end of paragraph 4.1.2:

"The maximum markup for the *Contractor*'s overhead and profit on a cash allowance shall be five percent (5%)."

27A.2 Delete the last sentence in paragraph 4.1.4.

27A.3 Delete paragraph 4.1.5 in its entirety and replace it with the following:

"The *Contract Price* shall be adjusted by *Change Order* to provide for any difference in the total value of all cash allowances and the actual cost of the *Work* performed under all cash allowances."

27A.4 Add new paragraph 4.1.8:

"4.1.8 The *Owner* may require the *Contractor* to obtain competitive bids, at no additional cost to the *Owner*, for portions of the *Work* to be paid from cash allowances."

28. GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

28.1 Delete GC 5.1 – FINANCING INFORMATION REQUIRED OF THE OWNER in its entirety including all paragraphs thereunder and replace it with "Intentionally left blank."

28.2 **GC 5.2 APPLICATIONS FOR PAYMENT**

28.3 Delete paragraph 5.2.1 in its entirety and replace it with a new paragraph 5.2.1:

"5.2.1 On a *Working Day* that is not more than 10 calendar days after the end of each *Payment Period*, a representative of the *Contractor* and the *Owner* shall attend a meeting to discuss and review the *Work* completed during the *Payment Period*, including quantities, if applicable (the "**Pre-Invoice Submission Meeting**"). The *Contractor* shall bring with it to the *Pre-Invoice Submission Meeting* the following:

.1 a draft of its anticipated application for payment for the applicable *Payment Period*;

.2 the schedule of values submitted in accordance with GC 5.2.4, and *Accepted* by the *Owner* in accordance with GC 5.2.5;

.3 *Subcontractor* and *Supplier* invoices and supporting materials;

.4 receipts for reimbursable expenses (where expressly permitted by the *Contract*, if at all);

.5 accounts and records documenting the cost of performing the *Work* attributable to any *Change Order* or *Change Directive*;

.6 any visual documentation (photos, videos, diagrams) evidencing the progress of the *Work*; and

.7 any other documents reasonably required by the *Contract Documents* or the *Owner*."

28.4 Delete paragraph 5.2.2 in its entirety and replace it with a new paragraph 5.2.2:

"5.2.2 Within 5 calendar days following the *Pre-Invoice Submission Meeting*, the *Contractor* shall deliver to the *Owner* its application for payment that complies with the requirements of GC 5.2.6 for *Work* performed during a *Payment Period* (the "**Proper Invoice Submission Date**"), provided that if the fifth (5th) calendar day following the *Pre-Invoice Submission Meeting* falls on a calendar day that is not *Working Day*, the *Proper Invoice Submission Date* shall be deemed to fall on the next *Working Day*. However, the following shall apply to the delivery of all *Contractor* applications for payment:

.1 If the *Contractor* fails to deliver its application for payment, at the interval prescribed in GC 5.2.2, subject to written approval by the *Owner*, the *Contractor* shall not be entitled to submit its application for payment until the next prescribed interval. Should the *Owner* decide to accept an application for payment submitted after the applicable *Proper Invoice Submission Date* (which the *Owner* is under no obligation to do), such acceptance shall not be construed as a waiver of any of the *Owner*'s rights, or as a waiver or release of the *Contractor*'s obligations to strictly comply with the requirements prescribed in this GC 5.2 – APPLICATIONS FOR PAYMENT;

.2 If an application for payment is delivered by the *Contractor* to the *Owner* on a day that is prior to an eligible *Proper Invoice Submission Date*, the application for payment will not be considered or reviewed by the *Owner* until the earliest eligible *Proper Invoice Submission Date* as identified in GC 5.2.2, at which point the application for payment will be deemed to have been received by the *Owner* for the purpose of review and evaluation;

.3 Notwithstanding any other provision of this *Contract*, the *Contractor* shall not deliver an application for payment for consideration as a *Proper Invoice* by the *Owner*, during the *Restricted Period (Proper Invoice)*;

.4 The *Owner* and the *Contractor* hereby consent to the giving and receiving of *Proper Invoices* electronically and in accordance with the requirements of this GC 5.2 – APPLICATIONS FOR PAYMENTS."

28.5 Amend paragraph 5.2.3 by adding the following to the end of that paragraph:

"but no amount claimed shall include *Products* delivered to the *Place of the Work* unless the *Products* are free and clear of all security interests, liens, and other claims of third parties, subject to claims for lien pursuant to the *Construction Act*."

28.6 Amend paragraph 5.2.4 by deleting the words "the *Consultant*, at least 15 calendar days" and replacing them with "the *Owner* at least 30 calendar days"

- and -

add the words "in a form acceptable to the *Owner*," after the words "*Contract Price*".

28.7 Amend paragraph 5.2.5 by the deleting the word "*Consultant*" and replacing it with "*Owner*".

28.8 Delete paragraph 5.2.6 in its entirety and replace it with a new paragraph 5.2.6:

"5.2.6 Each application for payment submitted pursuant to GC 5.2.2 shall:

.1 be in a form prescribed, or otherwise approved in writing, by the *Owner*;

.2 include all the requirements for a *Proper Invoice* prescribed by the *Construction Act* and the *Contract Documents*;

.3 be delivered to the *Owner* in the same manner as a *Notice in Writing*; and

.4 unless otherwise directed in writing by the *Owner*, by email to pay.inv@ontarionorthland.ca and to the *Owner*'s representative listed in Article A-6."

28.9 Amend paragraph 5.2.8 by adding the following new sentence at the end of that paragraph:

"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 the title has passed to the *Owner* pursuant to GC 13.1 – OWNERSHIP OF MATERIALS."

28.10 Add new paragraph 5.2.9 as follows:

"5.2.9 The *Contractor* shall prepare and maintain current *As-Built Drawings* which shall consist of the *Drawings* and *Specifications* revised by the *Contractor* during the *Work*, showing changes to the *Drawings* and *Specifications*, which current *As-Built Drawings* shall be maintained by the *Contractor* and made available to the *Owner* for review with each application for progress payment. The *Owner* reserves the right to retain a reasonable amount for the value of the *As-Built Drawings* not presented for review."

28.11 Add new paragraph 5.2.10 as follows:

"5.2.10 Upon receipt of an application for payment submitted for payment by the *Contractor* in accordance with GC 5.2 - APPLICATIONS FOR PAYMENT, the *Owner* will assess whether all of the requirements for a *Proper Invoice* are satisfied and, if the application for payment does not meet the requirements, the *Owner* will return the application for payment to the *Contractor* with reasons setting out why the application for payment does not meet the requirements for a *Proper Invoice* and the *Contractor* may resubmit the application for payment with all required information within three (3) *Working Days* of the *Contractor's* receipt of the *Owner's* reasons. For clarity,

.1 if an application for payment does not include all of the requirements for a *Proper Invoice* required by GC 5.2.6.2, it shall not be considered a "Proper Invoice" for the purposes of the *Construction Act* and the *Owner* shall have no obligation to make a payment and the time periods set out in GC 5.3 - PAYMENTS and in Section 6.4 of the *Construction Act* shall not apply until the *Contractor* has submitted an application for payment that includes all information required by GC 5.2.6.2;

.2 if the *Contractor* fails, refuses, or neglects to resubmits its application for payment within three (3) *Working Days* after it is returned in accordance with this GC 5.2.10, the *Contractor* shall be deemed to have failed to deliver its application for payment and GC 5.2.2.1 shall apply;

.3 where the *Contractor* disagrees with the *Owner's* assessment that some of the of the requirements for a *Proper Invoice* required by GC 5.2.6.2 are missing from its application for payment, nothing in this GC 5.2.10 shall prevent the *Contractor* from resubmitting the same application for payment without any additional or new information; and

.4 the *Owner* reserves the right, in its sole, absolute and unfettered discretion, to waive an error or minor irregularity in any application for payment delivered by the *Contractor* for the purposes of deeming an application for payment a "Proper Invoice" within the meaning of the *Construction Act*, but the *Owner* shall be under no obligation to exercise this right."

29. GC 5.3 PAYMENT

29.1 Delete paragraph 5.3.1 in its entirety and replace it with a new paragraph 5.3.1:

"5.3.1 After receipt by the *Owner* of an application for payment submitted by the *Contractor* in accordance with GC 5.2 – APPLICATIONS FOR PAYMENT:

.1 the *Owner* will either:

(a) issue a certificate for payment, with a copy to the *Contractor,* in the amount applied for in the *Proper Invoice*, or

(b) issue a certificate for payment*,* with a copy to the *Contractor*, for an amount determined by the *Owner* to be properly due to the *Contractor* after applying any credits, withheld amounts*,* or other set-offs which the *Owner* is entitled to notwithstanding any notice of dispute or disagreement that the *Contractor* may have served, along with the *Owner's* reasons why an amount other than what is claimed in the *Proper Invoice* is properly due to the *Contractor*, which finding the *Owner* may accept or amend prior to the *Owner* issuing a *Notice of Non-Payment*, if any, in accordance with GC 5.3.2;

.2 the *Owner* shall make payment to the *Contractor*, on account as provided in Article A-5,

(a) in the amount stated in the certificate for payment, or

(b) in the amount stated in the certificate for payment less such amount stated in the *Owner*'s *Notice of Non-Payment* issued pursuant to GC 5.3.2,

on the 28th calendar day after receipt of a *Proper Invoice*, unless such 28th calendar day lands on a day that is other than a *Working Day*, in which case payment shall be made on the next *Working Day* after such 28th day."

29.2 Add new paragraph 5.3.2 as follows:

"5.3.2 In the event that the application for payment delivered by the *Contractor* pursuant to GC 5.2 – APPLICATIONS FOR PAYMENT does not include the requirements for a *Proper Invoice* or if the *Owner* disputes the amount claimed as payable in the *Proper Invoice*, then the *Owner* shall within 14 calendar days of receipt of the application for payment, issue a *Notice of Non-Payment* (Form 1.1)."

29.3 Add new paragraph 5.3.3 as follows:

"5.3.3 Where the *Owner* has delivered a *Notice of Non-Payment*, as specified under GC 5.3.2, the *Owner* and the *Contractor* shall first engage in good faith negotiations to resolve the dispute. If within 10 calendar days following the issuance of a *Notice of Non-Payment*, the *Owner* and the *Contractor* cannot resolve the dispute, either party may issue a notice of *Adjudication* in a form prescribed under the *Construction Act*, in which case the *Owner* and the *Contractor* will agree to submit the dispute to *Adjudication* as set out under PART 8 – DISPUTE RESOLUTION. The amounts disputed and described under the *Notice of Non-Payment* shall be held by the *Owner* until all disputed amounts of the relevant *Proper Invoice* have been resolved pursuant to PART 8 – DISPUTE RESOLUTION any portion of the *Proper Invoice* which is not the subject of the *Notice of Non-Payment* shall be payable within the time period set out in paragraph 5.3.1.2."

29.4 Add new paragraph 5.3.4 as follows:

"5.3.4 Without limitation, the *Owner* shall be entitled to deduct from or, set off against, any payment of the *Contract Price* and any other amounts payable by the *Owner* to the *Contractor* under the *Contract*:

.1 any amount expended by the *Owner* in exercising the *Owner*'s rights under this *Contract* to perform any of the *Contractor*'s obligations that the *Contractor* has failed to perform;

.2 any damages, costs or expenses (including, without limitation, reasonable legal fees and expenses) incurred by the *Owner* as a result of the failure of the *Contractor* to perform any of its obligations under the *Contract*; or

.3 any other amount owing from the *Contractor* to the *Owner* under this *Contract*."

29.5 Add new paragraph 5.3.5 as follows:

"5.3.5 The *Contractor* represents, warrants, and covenants to the *Owner* that it is familiar with its prompt payment and trust obligations under the *Construction Act* and will take all required steps and measures to ensure that it complies with the applicable prompt payment and trust provisions under the *Construction Act* including, without limitation, section 8.1 of the *Construction Act*. Evidence of the *Contractor*'s compliance under this paragraph 5.3.5 will be made available to the *Owner* within 5 *Working Days* following receipt by the *Contractor* of a *Notice in Writing* making such request."

30. GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

30.1 Delete paragraph 5.4.1.2 in its entirety and replace it with the following:

".2 jointly with the *Contractor*, state the date of *Substantial Performance of the Work*, or a designated portion of the *Work*, in a certificate."

30.2 Delete paragraph 5.4.2 in its entirety and replace it with the following:

"5.4.2 After the date of *Substantial Performance of the Work* is established, the *Contractor* and all *Subcontractors* who have completed their subcontracts shall complete, on a commercially reasonable efforts basis, within thirty (30) days, all deficient work including providing the required *Close-Out Documentation*, unless the reasons for any delay is *Acceptable* to the *Owner*. All deficient work not completed within the above time may be completed by the *Owner* and the cost of this work may at the option of the *Owner* be deducted from the *Contractor*'s next application for payment, or otherwise recoverable upon written demand by the *Owner* to the *Contractor*."

30.3 Delete paragraph 5.4.3 and replace it with the following:

"5.4.3 Immediately following the issuance of a certificate of *Substantial Performance of the Work*, the *Contractor* shall publish the certificate referred to in paragraph 5.4.1.2 in the manner provided in the *Construction Act*. Failing valid publication by the *Contractor* within 3 *Working Days* following the issuance of the certificate, the *Owner* shall be at liberty to publish the certificate and back-charge the *Contractor* for its reasonable costs for doing so."

30.4 Delete paragraph 5.4.4 and replace it with the following:

"5.4.4 After publication of the certificate of the *Substantial Performance of the Work*, the *Contractor* shall submit an application for payment of the outstanding *Construction Act* holdback amount, which application for payment shall:

.1 include all of the requirements listed in Schedule A to these Supplementary Conditions, as applicable to the application for payment of the holdback amount; and

.2 include a statement that the *Contractor* has not received any written notices of lien or any claims for liens from any *Subcontractor* or *Supplier*.

After the receipt of a complete application for payment of the holdback amount from the *Contractor*, the *Owner* will issue a certificate for payment of the holdback amount, provided that such amount is subject to and will only become due and payable in accordance with GC 5.4.5 and the *Construction Act*."

30.5 Delete paragraph 5.4.5 and replace it with the following:

"5.4.5 The *Construction Act* holdback amount shall become due and payable the day immediately following the expiration of the holdback period prescribed by the *Construction Act*, subject to the occurrence of any of the following:

.1 the preservation of a lien in respect of the *Project* that has not been satisfied, discharged or otherwise provided for in accordance with the *Construction Act*;

.2 receipt by the *Owner* of a written notice of lien that has not been satisfied, discharged or otherwise provided for in accordance with the *Construction Act*; or

.3 prior to the expiry of 40 calendar days following the publication of the certificate of *Substantial Performance of the Work,* the *Owner* publishes a *Notice of Non-Payment* of holdback in accordance with the *Construction Act,* setting out the amount of holdback that will not be paid, which may include non-payment to secure the correction of deficiencies and/or the completion of the *Work*."

30.6 Add new paragraph 5.4.6 as follows:

GC 5.4.6 ANNUAL HOLDBACK RELEASE

5.4.6.1 This GC 5.4.6 applies to contracts where the *Work* extends beyond twelve (12) months from the date the *Contractor* first supplied services or materials under the *Contract*, subject to the following transition rule:

.1 For contracts entered into before 1 January 2026: The first annual holdback release shall occur on the second anniversary of the Contract date that follows 1 January 2026, and annually thereafter on each subsequent anniversary of the *Contract* date until *Substantial Performance* is achieved. For greater certainty, the first annual holdback release for such contracts shall include all holdback accrued from the commencement of the Contract to that date, in accordance with subsection 87.4(4) of the *Construction Act.*

.2 For contracts signed on or after 1 January 2026: The first annual holdback release shall occur on the first anniversary of the *Contract* date, and annually thereafter on each subsequent anniversary until *Substantial Performance* is achieved.

5.4.6.2 Within fourteen (14) days after each *Contract* anniversary triggering an annual holdback release under paragraph 5.4.6.1, the *Owner* shall publish a notice of annual release of holdback (Form 6) in accordance with subsection 26(3) of the *Construction Act.*

5.4.6.3 The annual holdback amount shall become due and payable:

.1 no earlier than sixty (60) days after the *Owner's* publication of Form 6; and
.2 no later than seventy-four (74) days after the *Owner's* publication of Form 6, subject to the exceptions in paragraph 5.4.6.4.

5.4.6.4 The *Owner* shall make payment of the annual holdback release unless a lien has been preserved or perfected in respect of the *Contract,* and:

.1 where the lien attaches to the *Place of the Work:*

(a) the lien has not been discharged under clause 41(1)(a) of the *Construction Act*; and

(b) no order declaring that the lien has expired, discharging the lien, or vacating the registration of the claim for lien or the certificate of action has been registered under section 49 of the *Construction Act;* or

.2 where the lien does not attach to the *Place of the Work:*

(a) the lien has not been satisfied;

(b) the lien has not been discharged under clause 41(1)(b) of the *Construction Act*; and

(c) no order declaring that the lien has expired or vacating the lien has been made.

5.4.6.5 To receive annual holdback release, the *Contractor* shall submit an application to the *Owner* that includes:

.1 all requirements for a *Proper Invoice* as set out in Schedule A;
.2 a written statement that the *Contractor* has not received written notices of lien or claims for lien from *Subcontractors* or *Suppliers* in respect of *Work* performed up to the anniversary date;
.3 a Statutory Declaration in the form set out in Schedule B confirming payment of all accounts up to the anniversary date, except amounts properly retained as holdback or amounts in legitimate dispute; and
.4 a current WSIB Clearance Certificate.

5.4.6.6 For clarity, annual holdback release does not affect:

.1 lien preservation or perfection timelines under the *Construction Act,* which continue to run from *Substantial Performance* and completion in accordance with sections 31 and 32 of the *Construction Act*;
.2 the finishing holdback retained under GC 5.4.5 and GC 5.5.6; or
.3 warranty obligations under GC 12.3.

5.4.6.7 Where the *Contractor* is performing work under multiple separate contracts with the *Owner* concurrently (including under a roster or master services agreement arrangement), each contract constitutes a separate "improvement" for *Construction Act* purposes, and:

.1 annual holdback obligations shall be calculated and managed separately for each contract;
.2 holdback amounts, lien rights, and trust obligations are determined separately for each CCDC 4 contract based on its own contract date and anniversary dates; and
.3 the Owner shall maintain separate holdback accounts for each contract.

30.7 Add new paragraph 5.4.7 as follows:

"5.4.7 Where the Construction Act allows for release of Construction Act holdback on subcontract work which is 100% complete prior to the release of holdback contemplated under GC 5.4.5, the *Contractor* may make application to the *Owner* and the *Consultant* by written request for a review by the *Consultant* to determine the date of completion of the subcontract and shall submit such supporting material as the *Consultant* may in its discretion require, including:

.1 Description of the scope of Work included in the subcontract.

.2 Declaration of Last Supply by the Subcontractor as prescribed in subsection 31(5) of the Construction Act (Form 7).

.3 Certificate of Completion of Subcontract as prescribed in subsection 33(1) of the Construction Act (Form 10).

.4 Workplace Safety & Insurance Board Clearance Certificate for the Contractor, the Subcontractor concerned, and any other Subcontractors and Suppliers who have provided any services to the Subcontractor.

.5 Statutory declaration by an officer of the Subcontractor in the form CCDC Document 9B - 2018.

.6 Contractor's written acknowledgement to the Owner that the requirements of the Contract Documents will not be altered by early release of the Construction Act holdback of the completed subcontracts.

.7 Confirmation by the bonding company that it has been notified of the intent to claim early release of holdback and does not object.

.8 Sufficient evidence to the Owner's reasonable satisfaction that, as of the date of the Contractor's application, no claims for lien have been preserved against the Place of the Work that have not been vacated by the posting of security, discharged, or otherwise addressed in accordance with GC 5.8 – CONSTRUCTION LIENS."

31. GC 5.5 FINAL PAYMENT

31.1 Delete GC 5.5 – FINAL PAYMENT in its entirety and replace it with the following:

"5.5.1 When *Ready-for-Takeover* has been achieved in accordance with GC 12.1 – READY-FOR-TAKEOVER and the *Contractor* considers the *Work* is complete, and after the *Contractor* and the *Owner* have attended a *Pre-Invoice Submission Meeting* analogous to the requirement in GC 5.2.1, the *Contractor* may submit an application for final payment to the *Owner* and the *Contractor* shall:

.1 include all of the requirements set out in GC 5.2.1, including without limitation those requirements listed in Schedule A to these Supplementary Conditions that are specific to an application for final payment;

.2 ensure that all warranties, *Extended Warranties*, records, operation and maintenance manuals, data books, literature maintenance sheets, list of outstanding work and deficiency list, *Waste Management Report*, keys, Certificate of Clearance from WSIB, proof of publication of the certificate of *Substantial Performance of the Work* and the *As-Built Record Drawings* are submitted to the *Owner* (collectively, the "**Close-Out Documentation**"). Such submissions shall constituent requirements for the *Proper Invoice* for final payment; and

.3 if applicable, (a) written confirmation from the *Owner* that the deficiencies or incomplete *Work* waived by the *Owner* pursuant to GC 12.1.2 have been fully rectified as of the date of the *Contractor's* application for final payment, and/or (b) written confirmation, signed by the *Owner* and the *Contractor,* that the *Contract Price* has been reduced by a specified amount in exchange for the *Owner* releasing the *Contractor* of its obligation to rectify the certain outstanding deficiencies and/or incomplete *Work* waived by the *Owner* pursuant to GC 12.1.2, as detailed in such written confirmation."

5.5.2 After receipt by the *Owner* of an application for final payment submitted by the *Contractor* in accordance with paragraph 5.5.1:

.1 the *Owner* will either:

(a) issue, with a copy to the *Contractor*, a certificate for payment, in the amount applied for in the *Proper Invoice*, or

(b) issue, with a copy to the *Contractor,* a certificate for payment for an amount determined by the *Owner* to be properly due to the *Contractor* after applying any credits, withheld amounts, or other set-offs which the *Owner* is entitled to notwithstanding any notice of dispute or disagreement that the *Contractor* may have served, along with the *Owner's* reasons why an amount other than what is claimed in the *Proper Invoice* is properly due to the *Contractor*, which finding the *Owner* may accept or amend prior to the *Owner* issuing a *Notice of Non-Payment*, if any, in accordance with GC 5.5.3;

.2 the *Owner* shall make payment to the *Contractor*, on account as provided in Article A-5,

(a) in the amount stated in the certificate for payment, or

(b) in the amount stated in the certificate for payment less such amount stated in the *Owner*'s *Notice of Non-Payment* issued pursuant to GC 5.3.2,

on the 28th calendar day after receipt of a *Proper Invoice*, unless such 28th calendar day lands on a day that is other than a *Working Day*, in which case payment shall be made on the next *Working Day* after such 28th day."

5.5.3 In the event that the application for final payment delivered by the *Contractor* does not include the requirements of GC 5.5.1 (including the requirements for a *Proper Invoice*) or where the *Owner* disputes the amount claimed as payable in the *Proper Invoice*, then the *Owner* shall within 14 calendar days of receipt of the application for payment, issue a *Notice of Non-Payment*. Where the *Owner* has delivered a *Notice of Non-Payment*, as specified under this GC 5.5.3, the *Owner* and the *Contractor* shall first engage in good faith negotiations to resolve the dispute. If within 10 calendar days following the issuance of a *Notice of Non-Payment*, the *Owner* and *Contractor* cannot resolve the dispute, either party may issue

a notice of *Adjudication* in a form prescribed under the *Construction Act*. The *Owner* and *Contractor* will then submit the dispute to *Adjudication* as set out under PART 8 – DISPUTE RESOLUTION.

5.5.4 The amounts disputed and described under the *Notice of Non-Payment* shall be held by the *Owner* until all disputed portions of the *Proper Invoice* for final payment have been resolved in accordance with PART 8 – DISPUTE RESOLUTION. Any portion of the *Proper Invoice* which is not the subject of a *Notice of Non-Payment* shall be payable within the time period set out in paragraph 5.5.2.2.

5.5.5 Subject to the provision of paragraph 10.4.1 of GC 10.4 – WORKERS' COMPENSATION, and any lien legislation applicable to the *Place of the Work*, the *Owner* shall make payment, to the *Contractor* in accordance with paragraph 5.5.2.2.

5.5.6 Notwithstanding anything else in this GC 5.5 – FINAL PAYMENT the *Owner* shall retain a finishing holdback as provided for in the *Construction Act*, which shall be released to the Contractor upon expiry of the lien period provided for under the *Construction Act*, provided no construction liens have been registered.

5.5.7 As additional requirements for release of finishing construction lien holdback, the *Contractor* shall submit the following documentation:

.1 a written declaration that no claims for lien or written notices of lien have been received by it;

.2 a *Statutory Declaration* in the form set out in Schedule B that all accounts for labour, subcontracts, *Products*, construction machinery and equipment, and other indebtedness which may have been incurred by the *Contractor* and for which the *Owner* might in any way be held responsible have been paid in full up to the previous progress payment, except for amounts properly retained as a holdback or as an identified amount in dispute; and

.3 a Workplace Safety & Insurance Board Clearance Certificate."

32. GC 5.8 WITHHOLDING OF PAYMENT

32.1 Add new paragraph GC 5.8 WITHHOLDING OF PAYMENT as follows:

"GC 5.8 WITHHOLDING OF PAYMENT

"5.8.1 Upon notice to the *Contractor*, the *Owner* may, subject to the *Owner*'s requirement to issue a *Notice of Non-Payment* under the *Construction Act,* withhold or retain all or any portion of any payment due to the *Contractor* under this *Contract* to ensure the performance of the *Work* or to protect the *Owner*'s rights in respect of the events set out in this paragraph 5.8.1, but only such portion of any payment as is reasonably necessary for such purpose. The *Owner* may make such withholding or retention upon the occurrence and continuance of any of the following events:

.1 the *Contractor* is in default of any of its material obligations under this *Contract*;

.2 all or any part of such payment is attributable to Work which is defective or not performed in accordance with the *Contract Documents*;

.3 the *Contractor* has improperly failed to make prompt payments to its *Subcontractors* and *Suppliers* respecting *Work* for which the *Owner* has made payment to the *Contractor*; or

.4 the amounts described in section 17(3) of the *Construction Act*.

5.8.2 In the event of deficiencies or delays in the *Work* that the *Contractor* fails or refuses to address upon receiving notice of same in accordance with the requirements of the *Contract*, the *Owner* may, without limiting the remedies available to it under this *Contract* and subject to the *Owner*'s requirement to issue a *Notice of Non-Payment* under the *Construction Act*, retain and set off as against any payments that would otherwise be owing to the *Contractor*, the reasonable costs of rectifying such deficiencies or delays as determined by the *Owner*.

5.8.3 In addition to any rights the *Owner* has pursuant to the *Construction Act* and subject to the *Owner*'s requirement to issue a *Notice of Non-Payment* under the *Construction Act*, if a lien is registered against

the *Place of the Work* or served upon the *Owner*, or an action commenced against the *Owner*, by any *Subcontractor*, the *Owner* having made all payments currently due in accordance with the payment terms of the *Contract Documents*, the *Owner* shall have the right to withhold from any money otherwise due to the *Contractor*, the full amount claimed in the lien action plus an additional amount sufficient to satisfy all of the *Owner* expenses relating to such lien action, including legal and consulting costs. These funds, less expenses incurred, shall be released to the *Contractor* upon the full discharge of all liens and dismissal of all actions against the *Owner*."

33. GC 5.9 CONSTRUCTION LIENS

33.1 Add new GC 5.9 – CONSTRUCTION LIENS as follows:

"**GC 5.9 – CONSTRUCTION LIENS**

5.9.1 Notwithstanding anything else in this PART 5 – PAYMENT, in the event a claim for lien is registered against title to the *Place of the Work* by the *Contractor*, a *Subcontractor* or a *Supplier*, or served on the *Owner* with regard to the *Project* by a *Subcontractor* or a *Supplier*, or the *Owner* receives a written notice of or claim for lien from a *Subcontractor* or a *Supplier*, the *Owner* shall be entitled to withhold any payment otherwise due to the *Contractor* until such time as such claims have been dealt with as provided below.

5.9.2 In the event that a claim for lien or a written notice of a lien is received by the *Owner* in relation to the *Project*, the *Contractor* shall, within ten (10) calendar days, at its sole expense, arrange for the vacating or the discharge of the claim for lien and/or the withdrawal of the written notice of lien or have the lien vacated pursuant to the *Construction Act*. If the *Contractor* commences an application to the Court to have the lien vacated, the *Contractor* shall provide the *Owner* with copies of all court documents submitted by the *Contractor* and the *Order* issued by the Court. If the lien is only vacated, the *Contractor* shall, if requested, undertake the *Owner*'s defence of any subsequent action commenced in the respect of the lien at the *Contractor*'s expense.

5.9.3 If the *Contractor* fails or refuses to take such steps as required under paragraph 5.9.2, the *Owner* shall, at its option, be entitled to take all steps necessary to vacate and/or discharge the claim for lien or the withdrawal of the written notice of lien, and all costs incurred by the *Owner* in doing so (including, without limitation, legal fees on a full indemnity basis and any payment which may ultimately be made out of or pursuant to security posted to vacate the lien) shall be the responsibility of the *Contractor*, and the *Owner* may deduct such amounts from the amounts otherwise due or owing to the *Contractor*.

5.9.4 Without limiting any of the foregoing, the *Contractor* shall satisfy all judgments and pay all costs resulting from any liens or any actions brought by a *Subcontractor* or *Supplier* in connection with any liens, or in connection with any other claim or lawsuit brought against the *Owner* by any person that provided services or materials to the *Project* which constituted part of the *Work*, and the *Contractor* shall indemnify the *Owner* for any and all costs (including, without limitation, legal fees on a solicitor and client basis) the *Owner* may incur in connection with such claims or actions.

5.9.5 Section 20(1) of the *Construction Act* does not apply to this *Contract* and no general lien arises under or in respect of the *Work*, such that all liens shall arise and expire on a lot-by-lot basis."

34. GC 6.1 OWNER'S RIGHT TO MAKE CHANGES

34.1 Amend paragraph 6.1.2 by adding the following to the end of that paragraph:

"This requirement is of the essence and it is the express intention of the parties that any claims by the *Contractor* for a change in the *Contract Price* and/or *Contract Time* shall not be approved unless there has been compliance with PART 6 – CHANGES IN THE WORK. No course of conduct or dealing between the parties, no express or implied acceptance of alterations or additions to the *Work* and no claims that the *Owner* has been unjustly enriched by an alteration or addition to the *Work*, whether in fact there is any such unjust enrichment or not, should be the basis for a claim for additional payment under this *Contract* or a claim for any extension of the *Contract Time*."

34.2 Add new paragraph 6.1.3 as follows:

"The *Contractor* agrees that changes resulting from construction coordination, including but not limited to site surface conditions, site coordination, and *Subcontractor* and *Supplier* coordination, are included in the *Contract Price* and shall not entitle the *Contractor* to claim an addition to the *Contract Price* in relation to coordination."

35. GC 6.2 CHANGE ORDER

35.1 Add new paragraph 6.2.3 as follows:

"The *Contractor* shall not be entitled to any additional compensation arising out of changes to the Work aside from the amounts determined and agreed to under this GC 6.2, or as provided in GC 6.3 – CHANGE DIRECTIVE. The *Contractor*'s fee for overhead and profit related to a *Change Order* or *Change Directive* shall be as set out in the *Contract Documents*."

35.2 Add new paragraph 6.2.4 as follows:

"*Change Orders* are not valid and binding upon the *Owner* unless approved and executed in accordance with the *Owner*'s internal approval processes."

36. GC 6.3 CHANGE DIRECTIVE

36.1 Delete paragraph 6.3.6.3 in its entirety and replace it with the following:

".3 The *Contractor*'s fee shall be as specified in paragraphs 6.2.3 and the *Contractor*'s fee for overhead and profit shall be as set out in the *Contract Documents*."

36.2 Amend GC 6.3.7.10 by adding the following to the end of the paragraph:

", provided that such amounts are not caused by negligent acts, omissions, or default of the *Contractor* or *Subcontractor*;"

36.3 Delete GC 6.3.7.17 in its entirety including all subparagraphs.

36.4 Amend paragraph 6.3.12 by deleting the words "the adjustment shall be referred to the *Consultant* for determination" and replacing them with "the Dispute shall be resolved in accordance with Part 8 – DISPUTE RESOLUTION."

37. GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

37.1 Delete paragraph 6.4.2 in its entirety and replace it with the following:

"The *Owner* will promptly investigate such conditions. If the *Owner* determines that the conditions differ materially and would cause an increase or decrease in the *Contractor*'s cost or time to perform the *Work*, the *Owner* will issue instructions for a change in the *Work* as provided in GC 6.2 – CHANGE ORDER or GC 6.3 – CHANGE DIRECTIVE. If the *Owner* determines that the conditions at the *Place of the Work* are not materially different or that no change in the *Contract Price* or the *Contract Time* is justified, the *Owner* will provide its reasons for this determination to the *Contractor* in writing."

37.2 Delete paragraph 6.4.3 in its entirety and replace it with the following:

"If the *Contractor* disputes the *Owner*'s determination in paragraph 6.4.2, the *Dispute* shall be resolved in accordance with Part 8 – DISPUTE RESOLUTION."

37.3 Amend paragraph 6.4.4 by deleting the words "and GC 9.5 – MOULD" and substituting the words "GC 9.5 – MOULD and GC 9.6 – IMPACT ASSESSMENT."

37.4 Add new paragraph 6.4.5 as follows:

"The *Contractor* acknowledges that it has received the *Impact Assessment Reports* for the *Project* that are described in the *RFP* documents and that it has considered the mitigation measures described in the *Impact Assessment Reports* in the *Contract Price*. If the *Impact Assessment Reports* are not completed prior to the closing of the *RFP* submission deadline, any adjustments required to the *Contract Price* shall be determined in

accordance with GC 9.6.2.3. The *Impact Assessment Reports* are provided for information only and the *Owner* shall not be liable for any errors or omissions in the reports."

37.5 Add new paragraph 6.4.6 as follows:

"The *Contractor* confirms that, prior to submitting its response to the *RFP* for the *Project*, it had the opportunity to carefully investigate the *Place of the Work* and applied to that investigation the degree of care and skill described in paragraph 3.12.1, given the amount of time provided between the issue of the *RFP* documents and the actual submission deadline for the *RFP*, the degree of access provided to the *Contractor* prior to submission of the response, and the sufficiency and completeness of the information provided by the *Owner*. The *Contractor* is not entitled to compensation or to an extension of the *Contract Time* for conditions which could reasonably have been ascertained by the *Contractor* by such careful investigation undertaken prior to the submission of its response."

38. GC 6.5 DELAYS

38.1 Delete paragraph 6.5.1 in its entirety and replace it with the following:

"If the *Contractor* is delayed in the performance of the *Work* by an act or omission of the *Owner* or anyone employed or engaged by the *Owner* directly, contrary to the provisions of the *Contract Documents*, then the *Contract Time* shall be extended for such reasonable time as the *Owner* determines. *The Contractor* shall be reimbursed by the *Owner* for its reasonable direct costs directly flowing from the delay but excluding any indirect, consequential, or special damages."

38.2 Delete paragraph 6.5.2 in its entirety and replace it with the following:

"If the *Contractor* is delayed in the performance of the *Work* by a stop work order issued by a court or other *Authority Having Jurisdiction* on account of a breach, violation, contravention, or a failure to abide by any laws, ordinances, rules, regulations, or codes or the advice, recommendations and instructions of public health officials directly by the *Owner*, the *Owner*'s *Other Contractor*(s) and relating to the *Work* or the *Place of the Work* and providing that such order was not issued as the result of an act or fault of the *Contractor* or any person employed or engaged by the *Contractor* directly or indirectly, then the *Contract Time* shall be extended for such reasonable time as the *Owner* determines in consultation with the *Contractor*. The *Contractor* shall be reimbursed by the *Owner* for the reasonable direct costs directly flowing from the delay but excluding any indirect, consequential, or special damages."

38.3 Delete paragraph 6.5.3 in its entirety and replace it with the following :

"6.5.3.1 If the performance of the *Work* or the performance of any other obligation(s) of a party to this *Contract* is delayed by *Force Majeure*, then the *Contract Time* shall be extended for such reasonable time as the *Owner* and the *Contractor* shall agree. The extension of time shall not be less than the time lost as a result of the event causing the delay, unless the *Contractor* and the *Owner* agree to a shorter extension. Neither party shall be entitled to payment for its costs incurred by such delays. Upon reaching agreement on the extension of the *Contract Time* attributable to the *Force Majeure* event, the *Owner* and the *Contractor* shall execute a *Change Order* indicating the length of the extension to the *Contract Time* and confirming that there are no costs payable by either party to the other for the extension of *Contract Time*.

6.5.3.2 Notwithstanding the foregoing, the *Owner* may issue a *Change Directive* requiring the *Contractor* to undertake those specific actions identified in the *Change Directive* as the *Contractor* can reasonably and safely initiate to remove or relieve either the *Force Majeure* or its direct or indirect effects on the *Project*, in which case the *Contract Price* will be adjusted in accordance with paragraph 6.3.7. If the *Contractor* fails within the time period specified in the *Change Directive* to take such action, then the *Owner* may, at its sole and absolute discretion and after it has given *Notice in Writing* to the *Contractor*, take some or all of such actions to partially or wholly remove or relieve such *Force Majeure* or its direct or indirect effects, and thereafter require the *Contractor* to resume the performance of the *Work*."

38.4 Delete paragraph 6.5.4 in its entirety and replace it with a new paragraph 6.5.4:

"No extension of the *Contract Time* will be approved unless the *Contractor* provides *Notice in Writing* to the *Owner* within 3 *Working Days* of the date upon which the *Contractor* ought reasonably to have been aware of the delay contemplated in paragraphs 6.5.1, 6.5.2 or 6.5.3. For the *Notice in Writing* to be valid under this paragraph 6.5.4 it must include specific details about:

.1 the cause of the delay;

.2 the likely impact the delay will have on the *Contract Time* and details of the extension of time being requested; and

.3 mitigation efforts, if any, undertaken by the *Contractor* or, where no mitigation efforts have been undertaken by the *Contractor*, the reasons why mitigation is either not possible or has not been undertaken by the *Contractor*."

38.5 Add new paragraph 6.5.6 as follows:

"6.5.6 If the *Contractor* delays the performance of the *Work* and such delay is for a cause within the *Contractor*'s control, the *Contractor* shall pay to the *Owner* the per diem rate for liquidated damages specified in Article 10 of the *Contract* for each day of delay if *Ready-for-Takeover* is not achieved in accordance with the time specified in Article A-1.3. If the per diem rate for liquidated damages is not specified in the *Contract Documents*, the Contractor shall pay to the *Owner* the *Administration Costs* incurred by the Owner as a result of the delay."

38.6 Add new paragraph 6.5.7 as follows:

"6.5.7 If the *Contractor* is delayed in the performance of the *Work* due to the replacement of a representative, worker, *Subcontractor* or *Supplier* pursuant to GC 3.5.4, 3.6.3 or 3.7.4, the *Contractor* shall pay to the *Owner* the per diem rate for liquidated damages specified in Article 10 of the *Contract* for each day of delay if *Ready-for-Takeover* is not achieved in accordance with the time specified in Article A-1.3. If the per diem rate for liquidated damages is not specified in the *Contract Documents*, the *Contractor* shall pay to the *Owner* the *Administration Costs* incurred by the *Owner* as a result of the delay.

38.7 Add new paragraph 6.5.8 as follows:

"6.5.8 If the *Contractor* disputes the determination by the *Owner* in paragraph 6.5.1 or paragraph 6.5.2, the *Dispute* shall be resolved in accordance with Part 8 – DISPUTE RESOLUTION."

39. GC 6.6 CLAIMS FOR A CHANGE IN THE CONTRACT PRICE

39.1 Amend paragraph 6.6.1 by deleting the words "and to the *Consultant*."

39.2 Amend paragraphs 6.6.3 and 6.6.4 by deleting the word "*Consultant*" and replacing it with "other party."

39.3 Delete paragraphs 6.6.5 and 6.6.6 in their entirety and replace them with the following:

"The other party, with respect to a claim made by a party under paragraph 6.6.1, shall make a determination by providing *Notice in Writing* to the claiming party within 30 *Working Days* after receipt of the claim by the other party, or within such other time period as may be agreed by the parties. If such determination is not acceptable to the claiming party, the claim shall be resolved in accordance with Part 8 – DISPUTE RESOLUTION."

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

40.1 Delete paragraph 7.1.2 in its entirety and replace it with the following:

"If the *Contractor* neglects to prosecute the *Work* properly including failing or neglecting to comply with the requirements in GC 3.5 – CONSTRUCTION SCHEDULE or otherwise fails to comply with the requirements of the *Contract* to a substantial degree and the *Owner* determines that sufficient cause exists to justify such action, the *Owner* may, without prejudice to any other right or remedy the *Owner* may have, give the *Contractor Notice in Writing* that the *Contractor* is in default of the *Contractor*'s contractual obligations and instruct the *Contractor* to correct the default in the 5 *Working Days* immediately following the receipt of such *Notice in Writing*.".

40.2 Amend paragraph 7.1.3.1 as follows:

Insert after the word "commences" the words "and is diligently proceeding with".

40.3 Revise paragraph 7.1.3.2 by substituting the words “an acceptable schedule” with “a schedule *Acceptable* to the *Owner*”.

40.4 Amend paragraph 7.1.4.1 by deleting the words “provided the *Consultant* has certified such cost to the *Owner* and *Contractor*”.

40.5 Amend paragraph 7.1.4.2 by adding to the end of the paragraph the words “and within 5 *Working Days* publish a notice of termination (form 8) in accordance with the *Construction Act*.”

40.6 Delete paragraph 7.1.5.3 in its entirety and replace it with the following:

“charge the *Contractor* the amount by which the full costs of finishing the *Work* as determined by the *Owner*, including compensation to the *Owner* for *Administration Costs* and a reasonable allowance to cover the cost of corrections to work performed by the *Contractor* that may be required under GC 12.3 – WARRANTY, exceeds the unpaid balance of the *Contract Price*. If the cost of finishing the *Work* is less than the unpaid balance of the *Contract Price*, the *Owner* shall pay the *Contractor* on the expiry of the warranty period specified in paragraph 12.3.1 for that portion of the *Work* performed by the *Contractor*, provided that such payment shall be made only in accordance with the requirements set out in GC 5.5 – FINAL PAYMENT and GC 5.8 - WITHOLDING FROM PAYMENT”.

40.7 Amend paragraph 7.1.5.4 by substituting the words “the difference” at the end of paragraph 7.1.5.4 with the words “for that portion of the *Work* performed by the *Contractor*, provided that such payment shall be made only in accordance with the requirements set out in GC 5.5 – FINAL PAYMENT and GC 5.8 - WITHOLDING FROM PAYMENT”.

40.8 Add new paragraph 7.1.7 as follows:

“The *Owner* may, if conditions arise which make it necessary for reasons other than as provided in paragraphs 7.1.1 and 7.1.4, suspend performance of the *Work* or terminate the *Contract* by giving *Notice in Writing* to that effect to the *Contractor* identifying the reason for the suspension and the expected length of the suspension. Such suspension or termination shall be effective in the manner specified in said notice and shall be without prejudice to any claims which either party may have against the other.”

40.9 Add new paragraph 7.1.8 as follows:

“The *Contractor* upon receiving notice of suspension or termination from the *Owner* shall suspend all operations as soon as reasonably possible except work which, in the *Contractor*’s opinion is necessary for the safety of personnel and for the care and preservation of the *Work*, the materials and plant. In the event of such suspension, the *Contractor* shall be reimbursed by the *Owne*r for the reasonable costs incurred by the *Contractor* for such protection. Subject to any directions in the notice of suspension or termination, the *Contractor* shall discontinue ordering materials, facilities and supplies and make every reasonable effort to delay delivery of existing orders and, in the event of termination, to cancel existing orders on the best terms available.”

40.10 Add new paragraph 7.1.9 as follows:

“During the period of suspension, the *Contractor* shall not remove from the *Place of the Work* any part of the *Work*, or any *Product* or materials without the consent of the *Owner*.”

40.11 Add new paragraph 7.1.10 as follows:

“If the *Work* should be suspended for a period of 30 days or less, the *Contractor*, upon the expiration of the period of suspension, shall resume the performance of the *Work* in accordance with the *Contract Documents*. If the suspension was not due to an act or an omission of the *Contractor*, there shall be an equitable adjustment to the *Contract Time* and the *Contract Price* as agreed upon by the *Owner* and the *Contractor*.”

40.12 Add new paragraph 7.1.11 as follows:

“If, after 30 days from the date of notice of suspension of the *Work* the *Owner* and the *Contractor* agree to continue with and complete the *Work*, the *Contractor* shall resume operations and complete the *Work* in accordance with the terms and conditions agreed upon by the *Owner* and the *Contractor*.”

40.13 Add new paragraph 7.1.12 as follows:

"The *Owner* may terminate this *Contract* at any time for any or no reason. Such termination shall be effective upon the date specified in the *Owner*'s *Notice in Writing* advising of the termination of the *Contract* pursuant to this paragraph 7.1.12. In such event, the *Owner* shall pay for the actual and verifiable *Work* performed up to the effective date of termination, including demobilization costs, and for such additional costs, if any, directly flowing from and which are a reasonable consequence of the termination, but excluding any consequential, indirect or special damages, termination fees, penalties or levies, and any claims for loss of profit, lost deposits, or lost opportunity. The *Owner* shall not be liable to the *Contractor* for any other claims, costs or damages whatsoever arising from such termination of the *Contract*. Within 3 *Working Days* of termination by the *Owner*, the *Contractor* shall deliver a *Notice in Writing* to each of its *Subcontractors* and *Suppliers* confirming the effective date of the termination."

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

41.1 Amend paragraph 7.2.1 by adding to the end of the paragraph the words "and within 5 *Working Days* publish a notice of termination (form 8) in accordance with the *Construction Act*."

41.2 Amend paragraph 7.2.2, by:

(i) adding the following after the words "public authority" in the second line:

"on account of a breach, violation, contravention, or a failure to abide by any laws, ordinances, rules, regulations, or codes of *Authorities Having Jurisdiction*, directly by the *Owner* or the *Owner*'s *Other Contractor(s)* and relating to the *Work* or the *Place of the Work*,"; and,

(ii) adding the following to the end of the paragraph:

"unless an acceptable arrangement for an extension of the *Contract Time* is agreed to by the *Contractor* and the *Owner*."

41.3 Delete paragraphs 7.2.3.1 and 7.2.3.2 in their entirety and replace them with "Intentionally left blank".

41.4 Delete paragraph 7.2.3.3 in its entirety and replace it with a new paragraph 7.2.3.3:

".3 the *Owner* fails to pay the *Contractor* when due the amount certified by the *Owner* or awarded by arbitration or a Court, except where the *Owner* has a bona fide claim for set off; or"

41.5 Amend paragraph 7.2.3.4 by deleting all the words after "degree" and replacing them with "and the *Contractor* confirms by a detailed *Notice in Writing* to the *Owner* that sufficient cause exists. Such detailed written statement must contain particulars, including references to the *Contract Documents*, and supporting documentation demonstrating the alleged default by the *Owner*."

41.6 Amend paragraph 7.2.4 by adding to the end of the paragraph the words "and within 5 *Working Days* publish a notice of termination (form 8) in accordance with the *Construction Act*."

41.7 Delete 7.2.5 in its entirety and replace it with the following:

"If the *Contractor* terminates the *Contrac*t under the conditions described in this GC 7.2, the Contractor shall be entitled to be paid for all *Work* performed to the date of termination. The *Contractor* shall also be entitled to recover the costs associated with termination, including the costs of demobilization, losses sustained on *Products* and construction machinery and equipment. The *Contractor* shall not be entitled to any recovery for any indirect, special or consequential losses."

42. GC 8.1 AUTHORITY OF THE CONSULTANT

42.1 Amend paragraph 8.1.1 by deleting the words "which are not resolved in the first instance by findings of the *Consultant* as provided in GC 2.2 – ROLE OF THE CONSULTANT."

42.2 Delete paragraph 8.1.2 in its entirety and replace it with "Intentionally left blank".

42.3 Amend paragraph 8.1.3 by deleting the word "*Consultant*" and replacing it with "*Owner*" in each instance where it occurs in the paragraph.

43. GC 8.2 ADJUDICATION

43.1 Delete GC 8.2 – ADJUDICATION in its entirety, including all subparagraphs thereunder.

44. GC 8.3 NEGOTIATION, MEDIATION, ARBITRATION AND ADJUDICATION

44.1 Delete GC 8.3 – NEGOTIATION, MEDIATION, AND ARBITRATION, including all paragraphs thereunder and replace it with the following:

"**GC 8.3 – NEGOTIATION, MEDIATION, ARBITRATION AND ADJUDICATION**

"8.3.1 Save and except where the *Contractor* has given an undertaking, in accordance with the *Construction Act*, to refer a dispute to *Adjudication*, prior to delivering a notice of *Adjudication* in a form prescribed by the *Construction Act*, the parties agree to first address all *Disputes* in a tiered approach as follows:

.1 A *Dispute* shall be referred to the *Owner*'s project manager for the *Project* and a representative of the *Contractor* of the equivalent seniority or position for resolution within a period not to exceed thirty (30) days.

.2 If unresolved, after following the process described in paragraph 8.3.1.1, the *Dispute* shall be referred to the *Owner*'s Director or Vice President who is responsible for the *Project* and an employee of the *Contractor* of the equivalent seniority or position for resolution within a period not to exceed thirty (30) days.

.3 If unresolved after following the process described in paragraph 8.3.1.2, and only at the election of the *Owner*, the *Dispute* shall be referred to the CEO of the *Owner* and the most senior executive employee of the *Contractor* for resolution within a period not to exceed thirty (30) days. If the *Owner* does not elect, at its sole option, to proceed under this paragraph 8.3.1.3, the *Dispute* may proceed to under either step as described in paragraphs 8.3.2 or 8.3.3.

8.3.2 If the *Dispute* remains unresolved despite the parties' attempting to resolve it following the process in paragraph 8.3.1, a party may elect to proceed with the *Dispute* by way of an *Adjudication*. If a party elects to proceed by way of an *Adjudication*, the other party shall not be bound to proceed by way of an *Adjudication*, save and except where the parties are obliged under the *Construction Act*. The following procedures shall apply to any *Adjudications* the parties engage in under the *Construction Act*:

.1 any hearings shall be held in the offices of the *Owner*, or, if such offices are unavailable, another venue as the parties may agree and which is acceptable to the adjudicator;

.2 the *Adjudication* shall be conducted in English;

.3 each party may be represented by counsel throughout an *Adjudication*;

.4 there shall not be any oral communications with respect to issues in dispute that are the subject of an *Adjudication* between a party and the adjudicator unless it is made in the presence of both parties or their legal representatives; and

.5 a copy of all written communications between the adjudicator and a party shall be given to the other party at the same time.

8.3.3 Any documents or information disclosed by the parties during an *Adjudication* are confidential and the parties shall not use such documents or information for any purpose other than the *Adjudication* in which they are disclosed and shall not disclose such documents and information to any third party, unless otherwise required by law, save and except the adjudicator.

8.3.4 In respect of any claim or dispute, if the *Contractor* fails to comply with any of the notice requirements set out in the *Contract Documents* then the *Contractor* shall be barred from advancing such claim(s) or dispute(s) and shall have no entitlement whatsoever in respect of such claim(s) or dispute(s) (including to an increase in payment under the *Contract*, or an extension of *Contract Time*) and by failing to comply with the notice requirements waives the right to make any such claim(s) or dispute(s) in an *Adjudication*

or in any other form of dispute resolution available under this *Contract* or at law. This GC 8.3.4 shall operate conclusively as an estoppel and bar in the event such claims or disputes are brought in an *Adjudication* or other form of dispute resolution and the *Owner* may rely on this GC 8.3.4 as a complete defence to any such claims or disputes.

8.3.5 The parties hereby acknowledge and agree:

.1 that counterclaims, claims of set-off or the exercise or use of other contractual rights that permit the *Owner* to withhold, deduct or retain from monies otherwise owed to the *Contractor* under the *Contract* may be referred to, and included as part of, *Adjudications* under the *Construction Act*;

.2 that disputes related to the termination or abandonment of the *Contract*, as well as any disputes that arise or are advanced following the termination or abandonment of the *Contract*, shall not be referred to *Adjudication* under the *Construction Act*;

.3 that notice(s) of *Adjudication*, with respect to any dispute or claim relating to the *Project*, shall not be given, and no *Adjudication* shall be commenced following *Ready-for-Takeover*, abandonment, or termination of the *Contract*;

.4 that any *Adjudication* between the *Contractor* and a *Subcontractor* or a *Supplier* that relates to an *Adjudication* between the *Owner* and the *Contractor* shall be joined together to be adjudicated by a single adjudicator, provided that the adjudicator agrees to do so, and the *Contractor* shall include a provision in each of its subcontracts that contain an equivalent obligation to this GC 8.3.5.4; and

.5 that, other than where the *Contractor* is obliged to commence an *Adjudication* pursuant to an undertaking under the *Construction Act*, neither the *Owner* nor the *Contractor* shall commence an *Adjudication* during the *Restricted Period (Adjudication).*

8.3.6 If the *Dispute* remains unresolved despite the parties attempting to resolve it following the process in paragraph 8.3.1, or following a determination of the *Dispute* pursuant to an *Adjudication* under paragraph 8.3.2, a party may elect to proceed with the *Dispute* under a mediation model to be agreed upon by the parties. A party shall elect to proceed to mediation no later than: (i) ten (10) days following the expiry of the timeline set out in paragraphs 8.3.1.2 or 8.3.1.3, whichever is the later, or (ii) ten (10) days following the rendering of the adjudicator's determination following an *Adjudication*. Where a party elects to proceed with mediation within the timelines prescribed in this paragraph 8.3.6, the other party shall be bound to proceed to mediation. No later than ten (10) days after a party makes an election to proceed to mediation, or such longer period as may be mutually agreed between the parties, the parties shall enter into a mediation agreement which shall set out the mediation process and designate the mediator.

8.3.7 If neither party elects to proceed to mediation within the timelines outlined in paragraph 8.3.5 or 8.3.6, or the parties are unable to enter into a mediation agreement within the time limits, the matter shall proceed and be finally resolved by binding arbitration by a single arbitrator in accordance with the *Arbitration Act* by an arbitration agreement to be executed by the parties and the arbitrator. The parties shall mutually agree on the selection of the arbitrator, failing which the arbitrator shall be appointed in accordance with the *Arbitration Act*. The arbitration proceedings shall take place in Toronto, Ontario, Canada. The language of the arbitration shall be English. The parties agree that any arbitration award, including with respect to costs, shall be binding on the parties, may be enforced in any court of competent jurisdiction and shall be final and no appeals or judicial reviews shall be permitted as of right or by application to any court of competent jurisdiction, except on errors of law. The parties shall each bear their own costs and their proportionate share of any joint costs of arbitration, subject to any award of an arbitrator.

8.3.8 The timelines in GC 8.3. may be amended by mutual agreement of the parties."

45. GC 8.4 RETENTION OF RIGHTS

45.1 Amend paragraph 8.4.1 by deleting all the words after "the party has" and replacing them with "complied with the provisions of GC 8.3."

45.2 Amend paragraph 8.4.2 by replacing "paragraph 8.3.6" with "paragraph 8.3.7".

45.3 Add new paragraph 8.4.3 as follows:

"8.4.3 If the parties proceed with an arbitration as described in paragraph 8.3.7, the *Contractor* agrees that this paragraph 8.4.3 shall be construed as a formal consent to the stay of any lien proceedings until an award is rendered in the arbitration or such dispute as otherwise resolved between the parties. In no event shall the *Contractor* be deprived of its right to enforce its lien against the *Project* should the *Owner* fail to satisfy any arbitral award against it in full on the dispute in respect of which the lien proceedings were commenced. Provided nothing in this paragraph 8.4.3 shall prevent the *Contractor* from taking the steps required by the *Construction Act* to preserve and/or perfect a lien to which it may be entitled."

46. GC 9.1 PROTECTION OF WORK AND PROPERTY

Amend paragraph 9.1.1.1 by adding the following words at the end of that paragraph:

"...which the *Contractor* could not reasonably have discovered applying the degree of care and skill described in paragraph 3.4.1 to its review of the *Contract Documents*."

46.1 Delete paragraph 9.1.2 in its entirety and replace it with the following new paragraph 9.1.2:

"Before commencing any work, the *Contractor* shall determine the locations of all underground utilities and structures indicated in the *Contract Documents* or that are discoverable by applying to an inspection of the *Place of Work* the degree of care and skill described in paragraph 3.12.1."

46.2 Add new paragraph 9.1.5 as follows:

"The *Contractor* shall neither undertake to repair and/or replace any damage whatsoever to the work of *Other Contractors*, or to adjoining property, nor acknowledge 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 the *Owner*. However, where there is danger to life or public safety, the *Contractor* shall take such emergency action as it deems necessary to remove the danger."

47. GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

47.1 Amend paragraph 9.2.7.3 by deleting the words "*Consultant* may recommend in consultation with the *Contractor* and" and replacing them with the words "*Owner* may determine in consultation with".

47.2 Add new paragraph 9.2.10 as follows:

"The *Contractor* shall indemnify and hold harmless the *Owner*, their agents and employees from and against claims, demands, losses, costs, damages, actions, suits or proceedings arising out of or resulting from exposure to, or the presence of, toxic or hazardous substances or materials which were either brought on to the *Place of the Work* by the *Contractor*, or anyone for whom the *Contractor* is in law responsible, and mishandled or handled negligently or improperly or which are otherwise mishandled or handled negligently or improperly by the *Contractor*, or anyone for whom the *Contractor* is in law responsible, thereby creating exposure to toxic or hazardous substances or materials. This obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity set out in GC 13.1 – INDEMNIFICATION or elsewhere in the *Contract* or which otherwise exist respecting a person or party described in this paragraph."

48. GC 9.4 CONSTRUCTION SAFETY

48.1 Delete paragraph 9.4.1 in its entirety and replace it with the following:

"9.4.1 The *Contractor* shall be solely responsible for construction safety at the *Place of the Work* and for compliance with the rules, regulations and practices required by the applicable construction health and safety legislation and shall be responsible for initiating, maintaining and supervising all safety precautions

and programs in connection with the performance of the *Work*. Without limiting the generality of the foregoing, the *Contractor* shall comply with the occupational health and safety laws and regulations and any orders, recommendations and restrictions made by the federal, provincial or municipal governments and the advice, recommendations and instructions of public health officials, as they apply to the *Place of the Work*. If the *Place of the Work* is located on the *Owner*'s premises, the *Contractor* shall comply with all the *Owner*'s policies and directions to ensure the health and safety of the *Owner*'s employees and *Other Contractors* as well as the *Contractor*'s employees, *Subcontractors* and *Suppliers*. The *Contractor* shall submit its Health and Safety Plan to the *Owner* for *Acceptance* prior to commencing the *Work*, which Plan shall include all the elements required by the *Specifications* for a Health and Safety Plan. The *Contractor* shall indemnify and hold harmless the *Owner* for any fines, penalties or other costs imposed or assessed on or incurred by the *Owner* arising from the *Contractor*'s failure to comply with the applicable health and safety laws, any orders, recommendations and restrictions of the federal, provincial or municipal governments or the advice, recommendations and instructions of public health officials. *"*

48.2 Amend GC 9.4.2 by adding the following words after "and the Contractor":

", Subcontractors and Suppliers".

48.3 Amend GC 9.4.3 by adding the following words after "and the *Contractor*":

", *Subcontractors* and *Suppliers*".

48.4 Delete paragraph 9.4.4 in its entirety and replace it with the following:

"9.4.4 Prior to the commencement of the *Work*, the *Contractor* shall submit to the *Owner*:

.1 a current WSIB clearance certificate;

.2 copies of the *Contractor*'s insurance policies having application to the *Project* or certificates of insurance, at the option of the *Owner*;

.3 documentation of the *Contractor*'s in-house safety-related programs; and

.4 a copy of the Notice of Project filed with the Ministry of Labour naming itself as "Constructor" under the *Occupational Health and Safety Act*."

48.5 Delete paragraph 9.4.5 in its entirety and replace it with the following:

"9.4.5 The *Contractor* shall indemnify and save harmless the *Owner*, its agents, officers, directors, employees, consultants, successors and assigns from and against the consequences of any and all safety infractions committed by the *Contractor* under the *Occupational Health and Safety Act* and any breaches of the *Emergency Management and Civil Protection Act* and related orders, recommendations or regulations, including the payment of legal fees and disbursements on a full indemnity basis."

48.6 Add new paragraph 9.4.6 as follows:

"9.4.6 The *Contractor* shall ensure that it and its employees, *Subcontractors* and *Suppliers* are aware of and, while being on the *Owner*'s property, comply with the *Owner*'s policies, including its Fit for Duty Policy, and with the Ontario Northland Operating Manual, including the Current Summary Bulletin, current Ontario Northland Time Table, C.R.O.R. 2022, Infrastructure Special Instructions, Dangerous Goods and Ontario Northland General Operating Instructions, as applicable."

48.7 Add new paragraph 9.4.7 as follows:

"9.4.7 In the event of an emergency threatening health, life or property, the *Contractor* shall take such action as may be necessary to save lives and protect persons from injury and to protect and preserve the property. The *Contractor* shall notify the *Owner* of such emergency as promptly as is practical under the circumstances."

49. GC 9.5 MOULD

49.1 Amend paragraph 9.5.3.3 by deleting the words "*Consultant* may recommend in consultation with the *Contractor* and" and replacing them with the words "*Owner* may determine in consultation with".

50. GC 9.6 IMPACT ASSESSMENT

50.1 Add new GC 9.6 – IMPACT ASSESSMENT as follows:

"**GC 9.6 IMPACT ASSESSMENT**

9.6.1 The *Contractor* shall be responsible for:

.1 ensuring that any potential impacts and areas of concern identified in the *Contract Documents* or *Impact Assessment Reports*, if provided, are mitigated during the *Work*; and,

.2 identifying any previously unknown impacts relating to fish, navigable waters, species at risk, vegetation, wildlife, socio-economic and heritage that arise prior to commencing the *Work* and during the *Work*.

9.6.2 If the *Contractor* or *Owner* observes or reasonably suspects the presence of any impacts described in paragraph 9.6.1.2 that are not mentioned or accounted for in the *Contract Documents* or *Impact Assessment Reports*, if any, and related mitigation plans,

.1 the observing party shall immediately report the circumstances to the other party;

.2 the *Contractor* shall immediately take reasonable steps, including stopping the *Work* if necessary, to ensure that any potential impacts are mitigated; and,

.3 if the *Owner* and *Contractor* do not agree on the existence, significance or mitigation measures for the impact, the *Owner* shall retain and pay for an independent qualified expert to investigate and determine the issue and the parties will enter into a *Change Order* if the mitigation measures will cause an increase or decrease in the *Contractor*'s cost or time to perform the *Work*.

9.6.3 If the *Contractor* fails to comply with the requirements in paragraph 9.6.2, the *Contractor* shall:

.1 be responsible for all costs incurred by the *Owner* or the *Contractor* to mitigate the damage caused due to the failure;

.2 not be entitled to request a *Change Order* relating to the failure to comply; and

.3 indemnify the *Owner* and hold it harmless from any claims, damages, costs, fines or other expenses, including reasonable legal fees and expenses, relating to or arising from the *Contractor*'s failure to comply with paragraph 9.6.2."

51. GC 9.7 ENVIRONMENTAL PROTECTION FOR CONSTRUCTION IN AND AROUND WATERBODIES

51.1 Add new GC 9.7 – ENVIRONMENTAL PROTECTION FOR CONSTRUCTION IN AND AROUND WATERBODIES as follows:

"**GC 9.7 ENVIRONMENTAL PROTECTION FOR CONSTRUCTION IN AND AROUND WATERBODIES**

9.7.1 The *Contractor* shall comply with the environmental protection requirements and mitigation measures that apply to construction involving work in and around waterbodies and on waterbody banks as set out in OPSS.PROV 182.

9.7.2 Pursuant to section 38(4) of the *Fisheries Act,* the *Contractor* has an obligation to notify the Department of Fisheries & Oceans("DFO") when the *Work* results in the unauthorized death of fish or a harmful alteration, disruption or destruction ("HADD") of fish habitat or where there is imminent danger that the death of fish or HADD of fish habitat could occur. The notification shall be done using the form attached as Schedule D. The *Contractor* shall also notify the *Owner* of any such incidents. Failure to notify DFO of such incidents is a federal offence.

9.7.3 In accordance with the *Fisheries Act*, notification must be made without delay to DFO after the *Contractor* ensures the immediate health and safety risks are managed at the *Place of the Work*. Updates to DFO may be provided at a later time, if required.

9.7.4 All spills and sediment releases into a waterbody during the *Work* must be immediately reported by the *Contractor* to the *Consultant* and the *Owner* who must report the release to the Spills Action Centre ("SAC") operated by the Ministry of Environment, Conservation and Parks ("MECP") at 800-288-6060. If the *Owner* is not available, the *Contractor* shall report the incident to SAC. The *Contractor* shall take all reasonable measures to mitigate or remedy any adverse effects that result from the occurrence or might reasonably be expected to result from it."

52. GC 9.8 ENVIRONMENTAL SPILLS AND RELEASES

52.1 Add new GC 9.8 – ENVIRONMENTAL SPILLS AND RELEASES as follows:

"**GC 9.8 ENVIRONMENTAL SPILLS AND RELEASES**

9.8.1 All spills and releases of hazardous substances in the course of the *Work* must be immediately reported by the *Contractor* to the *Owner* who will report the spill or release to the MOECP SAC. If the the *Owner* is not available, the *Contractor* shall report the incident to the MOECP SAC and the ONTC RTC at 800-558-4129 or EXT 141.

9.8.2 The *Contractor* shall take immediate steps to mitigate the damage to the environment and contain the spill or release. If the *Contractor* does not take timely action or, if the *Contractor* is not available, the *Owner* may direct others to remedy the situation.

9.8.3 If the spill or release was the fault of the *Contractor*, the remedial work shall be completed at the cost of the *Contractor* and with no additional cost to the *Owner* and the *Owner* shall be entitled to seek reimbursements for all costs associated with the remedial work including the cost of work done by third parties.

9.8.4 If the spill or release was not the fault of the *Contractor*, the *Owner* shall pay for the remedial work."

53. GC 10.1 TAXES AND DUTIES

53.1 Amend paragraph 10.1.2 by adding the following sentence at the end of that paragraph:

"For greater certainty, the Contractor shall not be entitled to any mark up for overhead or profit on any increase in such taxes and duties and the *Owner* shall not be entitled to any credit relating to mark up for overhead or profit on any decrease in such taxes."

53.2 Add new paragraph 10.1.3 as follows:

"Where an exemption or a recovery of sales taxes, customs duties, excise taxes or *Value Added Taxes*, rebates, or monies from incentive programs is applicable to the *Contract*, the *Contractor* shall, at the request of the *Owner*, assist, join in, or make application for any exemption, recovery or refund of all such taxes, duties, rebates and incentives and all amounts recovered or exemptions obtained shall be for the sole benefit of the *Owner*. The *Contractor* agrees to endorse over the *Owner* any cheques received from the federal or provincial governments, or any other *Authority Having Jurisdiction*, as may be required to give effect to this paragraph 10.1.3."

53.3 Add new paragraph 10.1.4 as follows:

"The *Contractor* shall maintain accurate records tabulating equipment, material and component costs reflecting the taxes, customs duties, excise taxes and *Value Added Taxes paid*."

53.4 Add new paragraph 10.1.5 as follows:

"Any refund of taxes, including without limitation, any government sales tax, customs duty, excise tax or *Value Added Tax*, whether or not paid, which is found to be inapplicable or for which exemption may be obtained, is the sole and exclusive property of the *Owner*."

53.5 Add new paragraph 10.1.6 as follows:

"The *Contractor* agrees to cooperate with the *Owner* and to obtain from all *Subcontractors* and *Suppliers* cooperation with the *Owner* in the application for any rebates, incentives or refund or exemption of any taxes, which cooperation shall include, but not be limited to, making or concurring in the making of an application for any such rebates, incentives, refund or exemption and providing to the *Owner* copies, or where required, originals of records, invoices, purchase orders and other documentation necessary to support such applications. All such rebates, incentives or refunds shall either be paid to the *Owner*, or shall be a credit to the *Owner* against the *Contract Price*, in the *Owner*'s discretion."

53.6 Add new paragraph 10.1.7 as follows:

"Customs duties penalties, or any other penalty, fine or assessment levied against the *Contractor* shall not be treated as a tax or customs duty for purposes of this GC 10.1."

54. GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

54.1 Delete paragraph 10.2.2 in its entirety and replace it with the following:

"The *Owner* has Crown immunity from the *Building Code Act* and the *Planning Act* and may not be obtaining building permits or development approvals. The *Owner* shall obtain and pay for any permanent easements over Third Party Property required for the completion of the Work. The *Contractor* shall be responsible for all other permissions for access to Third Party Property."

54.2 Add to the end of paragraph 10.2.4. the following:

"Whenever standards of law, ordinances, rules, regulations, codes and orders relating to the *Work* differ, the most stringent standards shall govern."

54.3 Amend paragraph 10.2.5 by adding the words, "Subject to paragraph 3.4.1" to the beginning of the paragraph.

- and -

Substitute the word "*Owner*" for the word "*Consultant*"

-and-

Add the following to the end of the second sentence:

"...and no further *Work* on the affected components of the *Contract* shall proceed until these changes to the *Contract Documents* have been obtained by the *Contractor* from the *Owner*."

54.4 Amend paragraph 10.2.6 by adding the following sentence at the end of that paragraph:

"In the event the *Owner* suffers loss or damage as a result of the *Contractor*'s failure to comply with paragraph 10.2.5, and notwithstanding any limitations described in paragraph 13.1.1, the *Contractor* agrees to indemnify and to hold harmless the *Owner* from and against any claims, demands, losses, costs, damages, actions, suits or proceedings resulting from such failure by the *Contractor*."

54.5 Amend paragraph 10.2.7 by adding the words "which changes were not, or could not have reasonably been known to the *Owner* or the *Contractor*, as applicable, at the time of deadline for submission of responses to the *RFP* and which changes did not arise as a result of a public emergency or other *Force Majeure* event" to the second line, after the words "authorities having jurisdiction".

54.6 Add new paragraph 10.2.8 as follows:

"The *Contractor* shall furnish necessary certificates as evidence that the *Work* installed conforms with laws and regulations of authorities having jurisdiction, including certificates of compliance for *Owner*'s occupancy or partial occupancy. These certificates are to be final certificates giving complete clearance of the *Work*."

55. GC 10.3 PATENT FEES

55.1 Delete paragraph 10.3.2 in its entirety.

56. GC 10.4 WORKERS' COMPENSATION

56.1 Add new paragraph 10.4.2 as follows:

"10.4.2 The *Contractor* shall be solely responsible for its employees and officers and for its *Subcontractors* and their officers and employees, including ensuring that all required employer filings, contributions, deductions, and payments are made or remitted, as the case may be, with respect to applicable employer health taxes and under the *Employment Insurance Act*, the Canada Pension Plan, the Ontario *Workplace Safety and Insurance Act, 1997*, and all equivalent legislation in any other applicable jurisdiction. Without limiting the generality of the foregoing, the *Contractor* shall indemnify, defend and hold harmless the *Owner*, its directors, officers, and employees from all claims, demands, actions, suits or proceedings arising from any health, medical, disability or similar claims which *Contractor*'s employees or officers or any of its Subcontractors or their officers or employees may make against the *Owner*, its directors, officers, or employees during or after the *Contract Time*, whether or not such claims are attributable to the *Contractor*'s or *Subcontractor*'s performance of the *Work* or related to the *Contractor*'s obligations under this *Contract*."

57. GC 11.1 INSURANCE

57.1 Delete all references to "the *Consultant*" in GC 11.1.

57.2 Amend the title of GC 11 to add the words "CONTRACT SECURITY" at the end of the title.

57.3 Delete items 1 to 8 in paragraph 11.1.1 and in CCDC 41 and replace with the following:

1. General Liability insurance shall be with limits of not less than $10,000,000 per occurrence, an aggregate limit of not less than $10,000,000 within any policy year with respect to completed operations, and a deductible not exceeding $50,000. To achieve the desired limit, umbrella or excess liability insurance may be used. Subject to satisfactory proof of financial capability by the *Contractor*, the *Owner* may agree to increase the deductible amounts. The insurance coverage shall not be less than the insurance provided by IBC Form 2100 (including an extension for a standard provincial and territorial form of non-owned automobile liability policy) and IBC Form 2320 including but not limited to:
   .1 Bodily injury, death, and property damage including loss of use thereof.
   .2 Premises and operations liability.
   .3 Products and completed operations liability.
   .4 Blanket contractual liability.
   .5 Cross liability and severability of interest clauses.
   .6 Contingent employer's liability.
   .7 Personal injury liability.
   .8 Owner's and Contractor's protective coverage.
   .9 Broad form property damage.
   .10 Elevator and hoist liability.
   .11 Liability for attached machinery, including loading and unloading.
   .12 Extension of coverage shoring; blasting; excavation; underpinning; demolition; on work; below ground surface work, including tunneling and grading, if applicable to the *Project*.

   The General Liability Insurance shall not include any exclusion relating to working in the vicinity of railway operations."

2. Automobile liability insurance in respect of vehicles that are required by law to be insured under a contract by a Motor Vehicle Liability Policy, shall have limits of not less than $5,000,000 inclusive per occurrence for bodily injury, death, and damage to property, covering all vehicles owned or leased by the *Contractor*.

3. Manned Aircraft and watercraft liability insurance with respect to owned or non-owned aircraft and watercraft (if used directly or indirectly in the performance of the *Work*),including use of additional premises, shall have limits

of not less than $10,000,000 inclusive per occurrence for bodily injury, death and damage to property including loss of use thereof and limits of not less than $10,000,000 for aircraft passenger hazard. Such insurance shall be in a form acceptable to the *Owner*.

4. Unmanned aerial vehicle liability insurance with respect to owned or non-owned aircraft (if used directly or indirectly in the performance of the Work), shall have limits of not less than $5,000,000 per occurrence or accident for bodily injury, death and damage to property or such amounts as required by any applicable law or regulation.

5. Contractors' equipment insurance coverage written on an “all risks” basis covering *Construction Equipment* used by the *Contractor* for the performance of the *Work*, shall be in a form Acceptable to the *Owner* and shall not allow subrogation claims by the insurer against the *Owner*. Subject to satisfactory proof of financial capability by the *Contractor* for self-insurance, the *Owner* may agree to waive the equipment insurance requirement.

6. Professional Liability Insurance (if applicable). This policy shall cover risks of errors, omissions or negligent acts in the performance of professional services for the *Project*. The Named Insureds are to be approved and accepted for coverage by the Insurer. This policy shall provide for a limit of liability of not less than $1,000,000 per claim and $2,000,000 in the aggregate (inclusive of defence costs and expenses).

7. Technology Liability Insurance (if applicable) for financial loss arising out of an error, omission, or negligent act in the rendering of services in an amount not less than **$5,000,000** per claim and **$5,000,000** aggregate. Such policy shall be on a claims made basis and shall provide coverage for damages and defense costs. The Technology Professional Liability policy will also include an insuring agreement for cyber or network security and privacy liability insurance, covering financial loss arising out of actual or potential unauthorized access, unauthorized use, and a failure to protect confidential information which results in loss or misappropriation of such information in both electronic and non-electronic format. Such insurance will have a limit of an amount not less than $5,000,000 per claim and $5,000,000 aggregate. The *Contractor* shall maintain said liability coverage in place for a three-year period after termination of the *Contract* by way of annual policy renewal, or purchase of extended reporting period.

8. “All Risks" Builders Risk and Boiler & Machinery Insurance (if applicable) shall have limits of not less than the sum of 1.1 times *Contract Price,* plus any property, including design services, the *Owner* provides for incorporation into the *Work*. This policy shall cover all risks of direct physical loss or damage to the *Project*, including but not limited to the perils of earthquake and flood, subject to policy sub limits, warranties and exclusions and shall not be less than the insurance provided by IBC Forms 4042 and 4047 or their equivalent replacement. This insurance shall cover all property forming part of the *Project*, and goods and materials to be incorporated in the *Project* while at the *Place of the Work*, in transit, or while in off-site storage. It shall not provide coverage for the *Contractor's* or *Subcontractors'* equipment other than scaffolding, formwork, fences, shoring, hoarding, falsework, tarpaulins and temporary buildings in connection with the *Work*. The insurance shall not have a deductible greater than $50,000.

9. Pollution Liability Insurance for an amount not less than $5,000,000 per occurrence and in the aggregate and a deductible of not more than $50,000. This policy shall be written on either an Occurrence or Claims Made Form and will provide coverage on a sudden and accidental, and gradual pollution events basis for on-site cleanup and remediation as well as on-site and off-site third party claims for bodily injury and property damage, cleanup and remediation.

58. GC 11.2 CONTRACT SECURITY

58.1 Add new GC 11.2 – CONTRACT SECURITY as follows:

“**GC 11.2 CONTRACT SECURITY**

11.2.1 If required by the *RFP*, the *Contractor* shall provide a performance bond and a labour and materials payment bond, each issued by a bonding company acceptable to *Owner* and licensed to issue such instruments in the *Place of the Work*, in the amounts and forms as follows:

.1 Amount of performance bond shall be equal to not less than 50% of the *Contract Price* in the form prescribed by the *Construction Act.*

.2 Amount of labour and material payment bond shall be equal to not less than 50% of the *Contract Price* in the form prescribed by the *Construction Act*.

11.2.2 The bonds provided in accordance with paragraph 11.2.1 shall guarantee the faithful performance of the *Contract* in accordance with the *Contract Documents*, including the requirements for warranties provided for the GC 12.3 – WARRANTY, and the payment of all obligations incurred in the event of the *Contractor*'s default, including but not limited to the following:

.1 the payment of legal, accounting, architectural, engineering and other professional services expenses incurred by the *Owner* in determining the extent of Work executed and any additional Work required as a result of the interruption of the *Work*, and its completion; and

.2 the payment of additional expenses to the *Owner* in the form of security guard services, light, heat, power, loss of use of premises, and other related costs, payable over the period between the default of the *Contract* and completion of the *Work*.

11.2.3 Without limiting the foregoing in any way, the bonds shall indemnify and hold harmless the *Owner* for and against costs and expenses (including legal and consultant services and court costs) arising out of or as a consequence of any default of the *Contractor* under this *Contract*.

11.2.4 The *Contractor* shall be responsible for notifying the surety company of any changes made to the *Contract Documents* or the *Contract Price* during the course of the *Work*.

11.2.5 The premiums for bonds required by the *Contract Documents* shall be included in the *Contract Price*.

11.2.6 Should the *Owner* require additional bonds by the *Contractor* or any of his *Subcontractors*, after the receipt of bids for the *Work*, the *Contract Price* shall be increased by the actual costs attributable to providing such bonds. The *Contractor* shall promptly provide the *Owner* with any such bonds that may be required."

59. GC 12.1 READY-FOR-TAKEOVER

59.1 Delete GC 12.1.1 in its entirety and replace it with the following:

"12.1.1 *Ready-for-Takeover* shall be achieved when all of the following has occurred, as verified and *Accepted* by the *Owner*:

.1 *Substantial Performance of the Work* has been achieved, as verified by the *Owner*;

.2 the appropriate permits (if any) for the *Place of the Work* have been obtained from the authorities having jurisdiction;

.3 the *Work* to be performed under the *Contract* has satisfied the requirements for deemed completion in accordance with Section 2(3) of the *Construction Act*,

.4 final cleaning and waste removal, as required by the *Contract Documents*;

.5 the *Contractor* has delivered to the *Owner* all inspection certificates from authorities having jurisdiction with respect to any component of the *Work* which has been completed;

.6 subject only to GC 12.1.2, the entire *Work* has been completed to the requirements of the *Contract Documents*, including completion of all items on the punch list prepared at the time of *Substantial Performance of the Work* and the *Work* is being used for its intended purpose, and is so certified by the *Consultant*;

.7 subject only to GC 12.1.2, the *Contractor* has submitted to the *Owner* in a collated and organized matter, all *Close-Out Documentation* and any other materials or documentation required by the *Contract Documents*;

.8 subject only to GC 12.1.2, all *Products*, systems and components of the *Project* have been commissioned and certified for operation and accepted by the *Owner*, and

.9 subject only to GC 12.1.2, the *Contractor* has submitted to the *Owner* full and complete *As-built Record Drawings* and *Specifications* revised by the *Contractor* to reflect the as-built state of the *Work*, clearly showing changes to the *Drawings* and *Specifications* from the original *Contract Documents*, all of which have been *Accepted* by the *Owner* acting reasonably."

59.2 Delete GC 12.1.2 in its entirety and replace it with the following:

"12.1.2 The *Owner* may, in its sole, absolute, and unfettered discretion, waive compliance with a requirement, or a part thereof, for achieving *Ready-for-Takeover* set out in GC 12.1.1.6 to 12.1.1.9 (inclusive). Where the *Owner* exercises the discretion afforded under this GC 12.1.2, the *Contractor* shall be required to comply with GC 5.5.1.3 as part of its application for final payment and the *Owner* and the *Contractor* shall establish a reasonable date for completing the *Work*."

59.3 Delete GC 12.1.3 in its entirety and replace it with the following:

"12.1.3 When the *Contractor* considers the *Work* has attained *Ready-for-Takeover*, it shall submit a written application to the *Owner* for review."

59.4 In GC 12.1.4, delete the words "list and" from the second line.

59.5 Delete GC 12.1.5 in its entirety and replace it with the following:

"12.1.5 Following the confirmation of the date of *Ready-for-Takeover* by the *Owner*, the *Contractor* may submit a final application for payment in accordance with GC 5.5 – FINAL PAYMENT."

59.6 Delete GC 12.1.6 in its entirety.

60. GC 12.2 EARLY OCCUPANCY BY THE OWNER

60.1 Delete GC 12.2 – EARLY OCCUPANCY BY THE OWNER in its entirety.

61. GC 12.3 WARRANTY

61.1 Amend paragraph 12.3.2 by adding the words, "Subject to paragraph 1.1.3...." at the beginning of that paragraph.

61.2 Delete paragraphs 12.3.4, and 12.3.5 and replace it with the following paragraphs:

"12.3.4 The *Contractor* shall correct, at no additional cost to the *Owner*, defects or deficiencies in the *Work* that appear, prior to and during the *Warranty Period*. Any *Work* repaired or replaced during the *Warranty Period* shall be re-warranted for an additional 12 months from the date of completion of the repair or replacement. Notwithstanding the expiration of the *Warranty Period*, the *Contractor* shall not be relieved of its obligations to correct any defects or deficiencies in the *Work* of which *Notice in Writing* has been given to the *Contractor* prior to the expiration of the *Warranty Period*.

12.3.5 The *Owner* shall provide *Notice in Writing* to the *Contractor* of defects and deficiencies in the *Work* discovered during the *Warranty Period*. The Contractor shall submit a remediation plan for the permanent rectification of the defects and deficiencies within 2 *Working Days* after delivery of the *Notice in Writing*, including the schedule for the remediation work to be completed. Upon *Acceptance* by the *Owner* of the remediation plan, the *Contractor* shall remediate the defects and deficiencies in accordance with the schedule set out in the *Accepted* plan. *Acceptance* by the *Owner* of a remediation plan does not prohibit the *Owner* from pursuing other remedies it may have against the *Contractor* arising from the defects and deficiencies in the *Work*.

61.3 Amend paragraph 12.3.6 by adding at the end of the paragraph the following:

"The *Extended Warranty Period* for each *Extended Warranty* described in the *Specifications* shall commence on the expiry of the *Warranty Period* described in paragraph 12.3.1. The *Extended Warranties* shall be submitted to the *Owner* as part of the *Close-Out Documentation*."

61.4 Add the following new paragraphs 12.3.7 to 12.3.12

12.3.7 The decision of the *Owner* shall be final as to the existence of such defects or deficiencies in the *Work*, the necessity of remedying same, and the remedial measures required.

12.3.8 If the *Contractor* fails to do the work to correct the defects or deficiencies, the *Owner* shall be entitled to carry out such work by its own forces or by *Other Contractors*. If such work is work which the *Contractor* should have carried out at the *Contractor's* own expense, the *Owner* shall be entitled to recover from the *Contractor* the cost thereof or may deduct the same from any monies due or that become due to the *Contractor*, including the warranty holdback, if any.

12.3.9 Any insurance, contract security, surety or deposit required by the *Contract Documents* shall remain in full effect at the expense of the *Contractor* during the *Warranty Period*.

12.3.10 The *Contractor* shall be responsible for the costs for inspection and testing for the correction of defects or deficiencies. The *Owner* shall have the right to deduct the cost of the inspection and testing from any monies owed to the *Contractor.*

12.3.11 The *Owner* may hold back, if set out in the *Contract Documents*, on each application for payment, advance payment or progress draw, 2.5% of the total amount payable under each such application for payment, advance payment or progress draw as security for the *Contractor*'s performance of its warranty obligations. In the event the *Contractor* fails to correct a defect or deficiency during the warranty period within the required time and/or fails to pay for the redesign, reconstruction and other costs related to damages arising from a defect or deficiency, the *Owner* shall have the right to use the warranty holdback, or such part of it still being held by the *Owner* to pay for the costs of remedying the defect or deficiency and any redesign, reconstruction or other costs relating to the defect or deficiency. If the costs are greater than the amount of the warranty holdback, the *Contractor* shall pay the additional costs upon receipt of an invoice from the *Owner*. The *Contractor* shall have the right to invoice the *Owner* for the balance of the warranty holdback at the end of the *Warranty Period* or *Extended Warranty Period* as described in paragraph 12.3.4.

12.3.12 The *Contractor* shall assign to the *Owner* all warranties, guarantees or other obligations for *Work*, services or *Products* performed or supplied by any *Subcontractor, Supplier* or other person in connection with the *Work* and such assignment shall be with the consent of the assigning party where required by law or by the terms of that party's contract. Such assignment shall be in addition to, and shall in no way limit, the warranty rights of the *Owner* under the *Contract Documents*. Until the expiry of the relevant *Warranty Periods* enforceable against the *Contractor*, the *Owner* shall have in its custody all warranties, guarantees and other obligations to third parties respecting the *Work*.

12.3.13 The *Contractor's* obligations under this GC 12.3 shall continue notwithstanding any withholding of payment made by the *Owner* under GC 5.8 **–** WITHOLDING OF PAYMENT or by performance by the *Owner* directly or through other forces of the *Contractor's* obligations under this *Contract,* where the *Contractor* is in default in the performance of such obligations."

62. GC 13.1 INDEMNIFICATION

62.1 Delete GC 13.1 – INDEMNIFICATION in its entirety and replace it with the following:

"13.1.1 The *Contractor* shall indemnify and hold harmless the *Owner* and its directors, officers, employees, contractors and agents (collectively the "*Owner's Indemnitees*") from and against all loss, liability, damage, fines, cost, legal cost and disbursement whatsoever arising out of or related to the *Work* or the *Contract Documents* ("*Loss*"), by whomever made, sustained, incurred, brought or prosecuted, arising out of, or in connection with, anything done or omitted to be done by the *Contractor* in the course of the performance of the *Contractor*'s obligations under the *Contract Documents* or otherwise in connection with the Work. The *Contractor* shall, at the *Owner*'s election, either assume the defence of every proceeding brought in respect of such *Loss*, or cooperate with the *Owner* in the defence, including providing *Owner* with prompt Notice of any possible *Loss* and providing the *Owner* with all information and material relevant to the possible *Loss*.

13.1.2 GC 13.1 – INDEMNIFICATION shall govern over the provisions of paragraph 1.3.1 of GC 1.3 – RIGHTS AND REMEDIES.

13.1.3 The *Contractor* shall make full and complete compensation for any bodily injury or death to any person and for any damage caused to the *Owner*'s or a third party's physical property by the *Contractor*'s act or omission.

13.1.4 The *Contractor* shall be liable for any claims arising from any personal injuries to or death of any of the *Contractor*'s employees, *Subcontractors* or *Suppliers* or from any *Loss* of or damage to any property belonging to the *Contractor* or its employees, *Subcontractors* or *Suppliers* during the performance of the *Work* unless caused by the negligent act or omission of *Owner*.

13.1.5 Notwithstanding any other provision of the *Contract Documents*:

(a) The *Owner* shall not be responsible for indirect, consequential, special, incidental or contingent damages of any nature whatsoever, including loss or revenue or profit or damages resulting from interruption of service or transmission. This limitation shall apply regardless of the form of action, damage, claim, liability, cost, expense or loss, whether in contract (including fundamental breach), statute, tort (including negligence), or otherwise, and regardless of whether the *Owner* has been advised of the possibility of such damages; and,

(b) Any express or implied reference to the *Owner* providing an indemnity or any other form of indebtedness or contingent liability that would directly or indirectly increase the indebtedness or contingent liabilities of the *Owner* or the Province of Ontario, whether at the time of execution of this *Contract* or at any time during the performance of the *Work* and the *Warranty Period*, shall be void and of no legal effect in accordance with s.28 of the *Financial Administration Act*, R.S.O. 1990, c. F.12.

13.1.6 The *Contractor* shall indemnify the *Owner* and the *Owner Indemnitees* and save them harmless from and against all Loss incurred by the *Owner* arising from:

(a) any decision or interpretation by any court or *Authority Having Jurisdiction* that: (i) any of the *Contractor*'s employees are an employee of the *Owner*; or (ii) the *Owner* is liable to pay statutory contributions or deductions in respect of any of the *Contractor*'s employees under any laws, including employment insurance, provincial health insurance, income tax or other employment matters;

(b) any health, medical disability or similar claims which the *Contractor* or *Contractor*'s employees may have during or after the term of this *Contract*;

(c) a claim by any third party against the *Owner* alleging that the *Submittals* and their use by the *Owner*, infringes any *Intellectual Property* rights;

(d) safety infractions committed by the *Contractor* under the *Occupational Health and Safety Act* or any other laws, guidelines or public health orders regulating health and safety at the *Place of the Work*;

(e) any claims against the *Owner* for the failure of the *Contractor* to protect the confidentiality of *Confidential Information;*

(f) exposure to, or the presence of, toxic or hazardous substances or materials which were either brought on to the *Place of the Work* by the *Contractor* or the *Contractor* mishandled or handled negligently or improperly the substances or materials;

(g) a claim from adjacent landowners or other third parties regarding damage to their property due to the *Work*; and

(h) the release into the environment of materials resulting from the *Work* that contain *Environmental Contaminants* during the transportation of such materials from the *Place of the Work* to the approved waste disposal site.

63. GC 13.2 WAIVER OF CLAIMS

63.1 Delete GC 13.2 – WAIVER OF CLAIMS in its entirety and replace it with the following:

"13.2.1 WAIVER OF CLAIMS BY OWNER

As of the date of the final certificate for payment, the *Owner* expressly waives and releases the *Contractor* from all claims against the *Contractor* including without limitation those that might arise from the negligence or breach of contract by the *Contractor* except one or more of the following:

.1 those made in writing prior to the date of the final certificate for payment and still unsettled;

.2 those arising from the provisions of GC 13.1 – INDEMNIFICATION or GC 12.3 – WARRANTY;

.3 those arising from the provisions of paragraph 9.6.1 of GC 9.6 – IMPACT ASSESSMENTS and arising from the *Contractor* failing to comply with the mitigation plans in the *Impact Assessment Reports* or failing to assess impacts and implement mitigation plans for impacts that arise during the Work;

.4 those arising from the provisions of paragraph 9.2.5 of GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES and arising from the *Contractor* bringing or introducing any toxic or hazardous substances and materials to the *Place of the Work* after the *Contractor* commences the *Work*;

.5 those arising from the provisions of paragraph 9.5.1 of GC 9.5 – MOULD and arising from the *Contractor* bringing or introducing mould to the *Place of the Work*; or

.6 those made in writing within a period of six (6) years from the date of *Substantial Performance of the Work*, as set out in the certificate of *Substantial Performance of the Work*, arising from the *Contractor*'s performance of the *Contract* with respect to material defects or deficiencies in the *Work*.

13.2.2 WAIVER OF CLAIMS BY CONTRACTOR

As of the date of the final certificate for payment, the *Contractor* expressly waives and releases the *Owner* from all claims against the *Owner* including without limitation those that might arise from the negligence or breach of contract by the *Owner* except:

.1 those made in writing prior to the *Contractor*'s application for final payment and still unsettled; and

.2 those arising from the provisions of GC 9.2 – TOXIC AND HAZARDOUS SUBSTANCES, GC 9.5 – MOULD, or GC 10.3 – PATENT FEES.

13.2.3 GC 13.2 – WAIVER OF CLAIMS shall govern over the provisions of paragraph 1.3.1 of GC 1.3 – RIGHTS AND REMEDIES."

64. PART 14 OTHER PROVISIONS

64.1 Add new PART 14 as follows:

"**PART 14 OTHER PROVISIONS**

GC 14.1 OWNERSHIP OF MATERIALS

14.1.1 Unless otherwise specified, all materials existing at the *Place of the Work* at the time of execution of the *Contract* shall remain the property of the *Owner*. 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 as its property when notified in writing to do so by the *Owner*.

GC 14.2 CONTRACTOR DISCHARGE OF LIABILITIES

14.2.1 In addition to the obligations assumed by the *Contractor* pursuant to GC 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.

GC 14.3 DAILY REPORTS/DAILY LOGS

14.3.1 The *Contractor* shall cause its supervisor, or such competent person as it may delegate, to prepare a daily log or diary reporting on weather conditions, work force of the *Contractor*, *Subcontractors*, *Suppliers* and any other forces on site and also record the general nature of *Project* activities. Such log or diary shall also include any extraordinary or emergency events which may occur and also the identities of any persons who visit the *Place of the Work* who are not part of the day-to-day work force.

14.3.2 The *Contractor* shall also maintain records, either at its head office or at the *Place of the Work*, recording manpower and material resourcing on the *Project*, including records which document the activities of the

Contractor in connection with GC 3.4 – CONSTRUCTION SCHEDULE, and comparing that resourcing to the resourcing anticipated when the most recent version of the schedule was prepared pursuant to GC 3.4 – CONSTRUCTION SCHEDULE.

GC 14.4 CONFIDENTIAL INFORMATION

14.4.1 The *Contractor* must not advertise or issue any information, publication, document or article (including photographs or film) for publication or media releases or other publicity relating to the *Work* or the *Owner*'s *Confidential Information* without the prior written approval of the *Owner*.

14.4.2 The *Contractor* must not, and must ensure that the *Contractor*'s personnel do not, without the prior written approval of ONTC:

.1 use *Confidential Information* other than as necessary for the purposes of fulfilling the *Contractor*'s obligations under this *Contract*; or

.2 disclose the *Confidential Information*, other than to the *Contractor*'s personnel who need the information to enable the *Contractor* to perform its obligations under this *Contract*, to the *Contractor*'s legal advisors, accountants or auditors, or where disclosure is required by law (including disclosure to any stock exchange).

14.4.3 The *Contractor* must, within 10 *Working Days* (or any other period agreed in writing by ONTC) after a direction by the *Owner* to do so, return or destroy all *Confidential Information* in the *Contractor*'s possession, custody or control.

14.4.4 If the *Owner* or the *Contractor* is required by law to disclose *Confidential Information*, it shall promptly notify the other party so that that party may intervene to prevent the disclosure.

14.4.5 The *Contractor* specifically acknowledges that *Owner* is subject to the *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. F. 4, and that the *Owner* may be compelled by law to disclose certain *Confidential Information*.

14.4.6 The rights and obligations under this Part continue after the termination of this *Contract*.

GC 14.5 CORRUPTION, FORCED LABOUR, SANCTIONS

14.5.1 The *Contractor* warrants that:

.1 no bribe, gift or other inducement has been paid, promised or offered to any official or employee of the *Owner*, the Ministry of Transportation, the Government of Ontario or any other government official relating to the *Owner* entering into this *Contract* with the *Contractor*.

.2 it will take reasonable steps to ensure that its officials and employees do not extort, accept or pay bribes or illicit payments, charge or accept fees that are not legally due or are in excess of those legally due, or unreasonably delay or obstruct the granting of permits, licences, or other such approvals in relation to the project. If the *Contractor* becomes aware of an actual or attempted bribe, extortion, delay or obstruction relating to this *Contract,* the *Contractor* shall report the incident to the *Owner* immediately.

.3 it is unaware of any forced labour or child labour being used at any step of the production of goods produced, purchased or distributed by it in Canada or elsewhere or for the production of goods imported by the *Contractor*.

.4 it has undertaken the appropriate due diligence to ensure its business and its supply chains do not use forced labour or child labour, including an assessment of its business and supply chains that may carry a risk of forced labour or child labour being used and the management of the risk. If applicable, the *Contractor* shall comply with the reporting requirements under the *Fighting Against Forced Labour and Child Labour in Supply Chains Act,* S.C. 2023 c.9.

14.5.2 In compliance with its international obligations or with United Nations obligations, Canada imposes

restrictions on trade, financial transactions or other dealings with a foreign country or its nationals. These sanctions may be implemented by regulation under such acts as the *United Nations Act*, the *Special Economic Measures Act (SEMA),* or the *Export and Import Permits Act*. The text of any such regulations is published in the Canada Gazette, Part II. It is the only text which is authoritative. The *Contractor* shall comply with any such regulations that are in force on the effective date of the *Contract* and will require such compliance by its first-tier *Subcontractor*s. The *Owner* relies on such undertaking from the *Contractor* to enter into this *Contract*, and any breach of such undertaking shall entitle the *Owner* to terminate this *Contract* for default and to recover damages from the *Contractor,* including excess re-procurement costs.

GC 14.6 COMMUNICATIONS

14.6 The *Owner* or the Government of Ontario will lead and make any announcements relating to this *Contract* and the *Work*. The *Contractor* shall not make any announcement of any kind, including press releases, social media posts, public declarations, or any form of publication or announcement, in relation to this *Contract* or the *Work* unless prior written consent is given by the *Owner*. Should the *Contractor* be contacted by any media outlet or other person or entity wishing to make any form of publication or announcement, or seeking any information, in relation to this *Contract* or the Work, the *Contractor* shall provide no comment and shall immediately notify the *Owner*. The *Contractor* shall immediately notify the *Owner* if it becomes aware of any publication or announcement relating to the *Contract* or the Work

GC 14.7 AUDIT

14.7 The *Contractor* shall keep proper and accurate financial accounts and records, including but not limited to its contracts, invoices, statements, receipts, and vouchers in respect of the *Project* for a least six (6) years after the date that *Ready-for-Takeover of the Project* was achieved (the "*Audit Period*"). The *Owner* has the right to audit all such financial accounts and records associated with the Project and the *Contract Documents*, including *Submittals*, timesheets, reimbursable out of pocket expenses, materials, goods and *Construction Equipment* claimed by the *Contractor*, at all reasonable times during the term of the *Contract* and the *Audit Period* by providing *Notice in Writing* of its intention to conduct the audit. The *Contractor* shall provide full access to the records to the *Owner* for the purpose of the audit.

GC 14.8 GENERAL

14.8.1 Nothing contained in this *Contract* shall be deemed or construed by the parties nor by any third party as creating the relationship of principal and agent, landlord and tenant, or of partnership or of joint venture between the parties.

14.8.2 In addition to those provisions which are expressly stated to survive the termination or expiration of this *Contract*, the provisions of this *Contract* that are by their nature intended to survive termination or expiration of this *Contract* shall continue in full force and effect subsequent to and notwithstanding termination or expiration until or unless they are satisfied.

14.8.3 This *Contract* may be executed with electronic signatures or may be executed and delivered by electronic transmission and the parties may rely upon all such signatures as though they were original signatures. This *Contract* may be executed in counterpart and all such counterparts shall, for all purposes, constitute one agreement binding on the parties."

Schedule "A" to the Supplementary Conditions

Requirements for a "Proper Invoice"

To satisfy the requirements for a *Proper Invoice*, the *Contractor*'s application for payment must satisfy the following criteria:

.1 is in the form of a written bill, invoice, application for payment, or request for payment;

.2 is in writing;

.3 contains the *Contractor*'s name, telephone number and mailing address and contact information of the *Contractor*'s project manager;

.4 contains the title of the *Project* and the *Owner*'s contract number or purchase order number under which the work was performed and the related request for qualification, tender, or request for proposal number, as applicable;

.5 contains the date the written bill, invoice, application for payment, or request for payment is being issued by the *Contractor*;

.6 identifies the period of time in which the Work, labour, services, *Products* and/or materials were supplied to the *Owner*;

.7 reference to the provisions of the *Contract* under which payment is being sought (e.g. progress payment / milestone, holdback, final payment, etc.);

.8 a description, including quantities where appropriate, of the labour, services, *Products*, or materials, or a portion thereof, that were supplied and form the basis of the *Contractor*'s request for payment;

.9 the amount the *Contractor* is requesting to be paid by the *Owner*, set out in a statement, based on the schedule of values *Accepted* under paragraph 5.2.5, separating out any statutory or other holdbacks, set-offs and HST;

.10 with each application for payment after the first, a written statement that all accounts for labour, services, subcontracts, materials, equipment, *Products*, and other indebtedness which may have been incurred by the *Contractor* and for which the *Owner* might in any way be held responsible have been paid in full up to the previous application for payment, except for amounts properly retained as a holdback or as an identified amount in dispute;

.11 with the applications for payment of holdback and for final payment, a *Statutory Declaration* in the form provided by the *Owner* attached as Schedule B stating that all accounts for labour, services, subcontracts, materials, equipment, *Products*, and other indebtedness which may have been incurred by the *Contractor* and for which the *Owner* might in any way be held responsible have been paid in full up to the previous application for payment, except for amounts properly retained as a holdback or as an identified amount in dispute;

.12 a current Workplace Safety Insurance Board Clearance Certificate;

.13 the progress report required under GC 3.4 CONSTRUCTION SCHEDULE, in the form provided by the *Owner* attached as Schedule C;

.14 an updated *Construction Schedule* in native and .pdf formats;

.15 if requested by the *Owner*, a current and valid certificate(s) of insurance for the insurance required under GC 11.1 – INSURANCE;

.16 the following statement: "Provided this *Proper Invoi*ce complies with the requirements of the *Contract* and provided no *Notice of Non-Payment* is issued by the *Owner*, payment is due within 28 days from the date this *Proper Invoice* is received by the *Owner*.";

.17 the name, title, telephone number and mailing address of the person at the place of business of the *Contractor* to whom payment is to be directed;

.18 in the case of the *Contractor*'s application for final payment;

(a) sufficient evidence that the *Contractor* has delivered all warranties to the *Owner*;

(b) sufficient evidence that the *Place of the Work* has been left in a clean and tidy condition, including evidence that any remaining materials, tools, equipment, temporary work, and waste products and debris have been removed from the *Place of the Work*;

(c) landfill waybills for the disposal of the waste products, debris and excess soil removed from the *Place of Work* in accordance with the *Waste Management Plan*; and

(d) an executed, original, full and final release of all claims that may arise as a result of the *Work*, which full and final release executed by the *Contractor* shall be in a form approved by the *Owner*;

.19 information identifying the authority, whether in the *Contract Documents* or otherwise, under which the services or materials were supplied;

.20 any other information that is prescribed in Article A-3, if any, or identified by the *Owner* as required;

.21 the amount invoiced to date;

.22 the percentage of the *Contract Price* invoiced; and

.23 the individual value of *Change Orders* approved during the invoice period and the cumulative value of *Change Orders* for the *Project*.

Ontario Northland

Statutory Declaration of Progress Payment Distribution by Contractor

To be made by the Contractor **prior to payment** as a condition for release of holdback.	The last application for progress payment for which the Declarant has received payment is No. _____ dated _____.

Identification of Contract:

Name of Contract (Location and description of the Work as it appears in the Contract Documents)

Date of Contract : Day : _____ Month : _____ Year : _____

Name of Owner: Ontario Northland Transportation Commission

Name of Contractor:

Name of Declarant: **Position or Title:** (of office held with Contractor)

Declaration

I solemnly declare that, as of the date of this declaration, I am an authorized signing officer, partner or sole proprietor of the Contractor named in the Contract identified above, and as such have the authority to bind the Contractor, and have personal knowledge of the fact that all accounts for labour, subcontracts, products, services, and construction machinery and equipment which have been incurred directly by the Contractor in the performance of the work as required by the Contract, and for which the Owner might in any way be held responsible, have been paid in full as required by the Contract up to and including the latest progress payment received, as identified above, except for:

Holdback monies properly retained,

Payments deferred by agreement, or

Amounts withheld by reason of legitimate dispute which have been identified to the party or parties, from who payment has been withheld.

I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath.

Declared before me in _____

City/Town Province

on _____.

Date

_____ _____

Signature of Declarant A Commissioner for Oaths or Notary Public

Schedule “C” to the Supplementary Conditions

Project Status Report	
Project Title:	
Reporting Period:	Date:
Project Details:	
Planned Budget: Indicate the original contract value	Current Approved Budget: Indicate the original contract value plus approved change orders
Planned Completion: Indicate the contract schedule completion date	Current Project Completion: Fill in revised date if schedule extension approved through change order
Planned Project Percent Complete: How far should they have progressed by this date?	Actual Project Percent Complete: What is their actual percent complete?
Executive Summary	
Provide a summary of what happened during the period, any concerns, risks or wins and plans for the upcoming period.	
Work Completed in the Period	
List List List List List	
Work Planned for Next Period	
List List List List	
Issues and Concerns	
Use this area to identify any concerns related to the project.	
Status of Progress	

Include a graph to show progress or eliminate this section.

Schedule "D" to the Supplementary Conditions

DUTY TO NOTIFY/EMERGENCY WORKS NOTIFICATION FORM

ONTC DUTY TO NOTIFY / EMERGENCY WORKS NOTIFICATION FORM	
SUBMISSION REQUIREMENTS Contact DFO By Phone 1-855-852-8320 **AND** submit this form to fisheriesprotection@dfo-mpo.gc.ca Submit this form to the consultant and the ONTC Project Manager: Esmail Zougari, esmail.zougari@ontarionorthland.ca and to ONTC Legal : legal@ontarionorthland.ca MNRF Office: Contact Area MNRF Office	
PART 1: NOTIFICATION DETAILS	
Type of Notification: □ DUTY TO NOTIFY □ EMERGENCY WORK	
Date of Notification:	Time of Notification:
ONTC Contract #:	DFO PATH File # (if applicable):
PART 2: REPORTING INFORMATION	
Name of Person Reporting:	Name of Field Contact:
Telephone #:	Telephone #:
Email:	Email:
PART 3: INCIDENT INFORMATION	
Bank failure □ Culvert failure Erosion and Sediment Control Measures Failure □ Beaver dam breach Other (specify): □ Hwy shoulder failure	
Date of Incident:	Time of Incident:
Location of Site:	Geographic Coordinates (Lat/Long):
Nearest Community (city/town):	Name of Waterbody(ies): Type (watercourse, lake/pond, ditch):
Indicate if any of the following impacts have occurred or are about to occur: Fish Kill (if yes, approximately how many):_____ □ Sediment deposition in channel Bank failure □ Obstruction of fish passage through: Modification of flows □ Channel □ Culvert Other (specify):	

Immediate Actions Taken:

(Describe the activities/works that are being / have been immediately implemented. e.g. mitigation measures, damming / pumping etc.)

Photos: □ Attached

(Where feasible, it is recommended that the photos be submitted with the form or as follow up)

PART 4: EMERGENCY WORKS

Description of Proposed Emergency Works:

(Be as specific as possible. Describe what work will be undertaken within the next two weeks.

E.g. culvert replacement (include existing and new culvert diameter / length / type), slope restoration (include material / method),:

Mitigation measures:

(Describe what measures have been or will be implemented to address the immediate issue. E.g. sediment fence, turbidity curtain, check dam, fish salvage etc.):

Indicate which of the works will be followed (if applicable):

Beaver Dam Removal □ Culvert Maintenance

Bridge Maintenance □ Like-for-like culvert replacement

Ditch maintenance within 30 m of a □ Temporary watercourse crossing waterbody

Riparian vegetation maintenance in existing right-of-way

The Emergency Works are (check one):

Temporary (additional work will be required) □ Final (no additional work required)

Proposed Start Date: (YYYY/MM/DD)	Proposed End Date: (YYYY/MM/DD)

PART 5: OTHER AGENCIES NOTIFIED

Other Agency(ies) Notified: Yes □ No □	Agency(ies) Notified:
Date Notified:	Incident Report No. (if issued by notified Authority):

END OF SUPPLEMENTARY CONDITIONS

ONTARIO NORTHLAND – SPECIAL SUPPLEMENTARY CONDITIONS - DESIGN-BUILD – CCDC 2 – 2020 REV 28 MAY 2024

THESE SPECIAL SUPPLEMENTARY CONDITIONS AMEND AND TAKE PRECEDENCE OVER THE AGREEMENT, DEFINITIONS AND GENERAL CONDITIONS OF THE CCDC 2 2020 AND THE ONTARIO NORTHLAND SUPPLEMENTARY CONDITIONS CCDC 2 2020 (REV 20 FEBRUARY 2026)

SSC1 DEFINITIONS

Add new definitions:

Construction Documents consist of *Drawings, Specifications* and other documents prepared by or on behalf of the *Contractor,* based on the *Contract Documents* and *Accepted* in writing by the *Owner* as meeting the *Owner's* requirements as described in the *Contract Documents*.

Contractor Consultant means the person or entity, other than the *Consultant* retained by the *Owner*, that may be engaged by the *Contractor* to perform all or part of the *Design Services*.

Design Services are the professional design and related services required by the *Contract Documents.*

Owner's Statement of Requirements means the written requirements and information provided by the *Owner* for the *Design Services*.

Amend the definition of *Work* by adding the words "including the *Design Services*" at the end of the definition.

SSC2 DESIGN SERVICES

Add new GC 2.6 DESIGN SERVICES

2.6.1 The *Contractor* shall submit the timing of the major activities of the *Design Services* as part of the *Construction Schedule* required by GC 3.4.1 and any revisions thereto. The *Owner* and the *Contractor* shall agree on the schedule for the submission of the *Construction Documents* by the Contractor and the time required for review of the submittals of the *Construction Documents* by the *Owner* and the *Consultant.*

2.6.2 The *Contractor* shall notify the *Owner* and the *Consultant* of any significant error, inconsistency or omission discovered in the *Owner's Statement of Requirements* or other information provided by or on behalf of the *Owner*. The *Contractor* shall not proceed with the *Design Services* until the *Contractor* and the *Owner* have agreed in writing how the information should be corrected or supplied.

2.6.2 The *Owner* and the *Consultant* shall review the design in the design development documents and proposed *Construction Documents* as the *Design Services* proceed to confirm that the design is in compliance with the *Owner's Statement of Requirements* and the *Contract Documents*. At the time of submission, the *Contractor* shall advise the *Owner* and *Consultant* in writing of any significant deviations in the proposed *Construction Documents* from the requirements of the *Contract Documents*, which the *Owner* may *Accept* or reject.

2.6.3 The review by the *Owner* and the *Consultant* shall not relieve the *Contractor* of responsibility for errors or omissions in the *Construction Documents* nor for meeting all requirements of the *Contract Documents* unless the *Owner Accepts*, in an approved *Change Order*, a deviation from the *Contract Documents*.

2.6.4 Upon completion of the final review of the *Construction Documents* by the *Owner* and the *Consultant*, the *Owner* shall advise the *Contractor* in writing that the *Owner* has *Accepted* or rejected the proposed *Construction Documents*. If rejected, the *Owner* shall provide the *Contractor* with the reason for the rejection and the *Contractor* shall revise the proposed *Construction Documents* to address the non-conformance and submit the revised *Construction Documents* to the *Owner* and *Consultant* for review within the time agreed to by the *Contractor* and *Owner.* The *Contractor* shall advise the *Owner* in writing of any revisions other than those requested by the *Owner*.

2.6.5 The *Contractor* shall be fully responsible to the *Owner* for:

.1 acts and omissions of a *Contractor Consultant*;

.2 the *Design Services* performed by a *Contractor Consultant* which *Design Services* shall be provided with the degree of care, skill and diligence that would normally be exercised by an experienced, skilled and prudent consultant supplying design services for similar projects; and

.3 the quality of the *Design Services* and shall undertake the quality control activities that are required to ensure such quality.

2.6.6 The *Owner* may, for reasonable cause, at any time before the *Contractor* has executed the contract with a *Contractor Consultant*, object to the use of a *Contractor Consultant* and require the *Contractor* to use another *Contractor Consultant.*

2.6.7 Upon receipt of a *Notice in Writing* from the *Owner,* the *Contractor* shall take action to rectify any situation involving a *Contractor Consultant* whose work is unsatisfactory to the *Consultant* or the *Owner* or who are considered by the *Consultant* or the *Owner* to be unskilled or otherwise objectionable. If, after the *Owner* has provided the notice to the *Contractor*, the *Contractor* is not able to rectify the concerns of the *Owner* to the satisfaction of the *Owner,* then the *Contractor Consultant* shall be removed from the *Project* and the *Contractor* shall indemnify and hold the *Owner* and the *Consultant* harmless from and against any damages, costs, expenses, claims, injuries and other liabilities suffered by the *Owner* or the *Consultant* arising from the dismissal of such *Contractor Consultant*.

APPENDIX B - RFP PARTICULARS

A. THE DELIVERABLES

SCOPE OF SERVICES

Introduction

Ontario Northland Transportation Commission ("ONTC") is seeking proposals for Design-Build project delivery services to complete the design and construction replacing an outdoor transformer, primary transformer conductor and associated connection and breakers within an existing outdoor electrical switchgear without interrupting current operations. The transformer and breakers require replacement since they are in poor condition, and replacement parts can't be supplied. ONTC has a backup locomotive generator setup (APU) to provide temporary power that can be utilized during the electrical switchover.

The anticipated completion date for the project is **September 30, 2027**. The transformer and breakers must be ordered upon project award due to the long lead times of the equipment.

ONTC is seeking "turnkey" proposals from proponents who can complete the entire project from start to finish within project constraints (budget, time, quality).

This scope includes, but is not limited to, providing design and engineered drawings, specifications, testing, supply and delivery of equipment, and applicable contracting and electrical subcontracting services to complete the project.

Background

The Cochrane Shop complex has an outdoor main transformer and outdoor electrical switchgear enclosure including 6 switchgear breakers that supplies power to all the shop buildings and wayside power at 326 Second Street, Cochrane, ON. These have been installed in the late 1980's and are supplied by a customer owned high voltage line. The 2000 kVA transformer is in poor condition with an elevated risk of failure due to a severe corrosion of high side bushing enclosure, and significant percentage difference in secondary winding resistance. The electrical switchgear breaker includes Siemens RL breakers that are now obsolete.

Project Site: The new transformer and breakers will be replaced in place as shown in the map below.

Project Location

- GPS Coordinates: **46.31391729299576, -79.43853133382531**

Project Map- Aerial View



Summary of Project Requirements

General Responsibilities and Project Intent:

1. The scheduling intent is to purchase the transformers and breakers within this fiscal year (ending March 2027) due to long lead times, with construction planned for summer 2027 in the following fiscal year. Payments shall be structured to accommodate this schedule.
2. The Contractor is expected to provide design and construction turnkey activities for this project, resulting in a finished, fully functional, electrical service that satisfies all project requirements and contract terms.
3. Coordination with Northern Ontario Wires, ESA, and Authorities Having Jurisdiction (AHJ) is the contractor's responsibility. Carry all costs.
4. Determine project requirements based on reviewing the original shop drawings, Maintenance Report and Engineering report as attached in the Appendix

Electrical Requirements

1. Supply and Install New Transformer:

- Transformer Specs to meet the following requirements as per the existing transformer.
- 1.5/2MVA, 27.6kV Wye 150kV BIL - 480V Delta 30kVA BIL, 60 Hz
- Tap Change OCTC, Tapping on HV +5% to -5% @2.5%
- Insulation Class - Class A, Mineral oil, 65C rise
- Impedance 6%85C (+/- 7.5% of tolerance)
- Pad mount Transformer
- Vector Group YNd1, Copper Winding

2. Wayside Switchgear Retrofit Breakers in existing enclosure to meet the following requirements: (Refer to existing shop drawings and pictures for further details)

    - 6 X 800A LSI Fix mount, manually operated 42KA @ 480V breakers to suit the existing enclosure.
    - Provide metal work, hardware, bus bars, and doors with escutcheons to suit existing enclosure.
    - Provide setup and coordination of new breakers

3. Engineering Scope

    - Update existing Arch Flash/Coordination Study and Single Line
    - Submit design drawings and specifications at 50% and 100% completion to ONTC for review
    - Perform site review and confirm all measurements of transformer and existing electrical enclosure for retrofit breakers
    - Review and approve shop drawings.

4. Contractor Scope

    - Removal of old transformer from site
    - Supply and delivery of new transformers
    - Installation and connection of the new transformer
    - Replacement of cable terminations
    - Primary cable replacement. Provide new cable and conduit (1R(1/0 AWG, Copper)
    - 12 months supplier warranty from the date of delivery

5. Testing Scope

    - Standard routine/FAT as per CSA shall be conducted
    - Site preservice testing for the new transformer as per NETA ATS standard.
    - Transformer Auxiliaries connections and testing
    - Testing of the 27.6 kV cables from the switch to the transformer
    - Ground grid testing by means of Fall of Potential and point to point testing in accordance with IEEE 80-2013 and IEEE 81-2012

Contractor Requirements:

Note: The following list of items is to be used as a guideline only and may not include all the tasks to complete the work.

1. The Contractor will be required to complete the work in accordance with all applicable federal, provincial, and municipal laws.

2. The Contractor shall coordinate Work with the owner's representative.
3. The Contractor will be required to obtain and pay for all necessary permits, fees, and ministry notifications required for the project including, but not limited to, the following:

- Filing notice of project with the Ontario Ministry of Labour.
- Registering as Constructor with the Ontario Ministry of Labour.

4. **The Contractor shall schedule to replace the transformer and breakers when it is not freezing during the spring and summer. This must be clearly outlined in the schedule and proposed approach.**

5. **Building Permit will not be required for this work**. All other permits required for the work are to be obtained by the contractor.

6. The Contractor shall provide qualified personnel to perform the work.

7. Construction activities should be conducted on weekdays between 7 am to 5 pm. Working outside these hours can be done but if only approved by ONTC Representative post submitting a request at least 3 days ahead of time to ONTC Representative for approval.

8. The Contractor will be required to secure their work area (create construction islands) for the duration of the project. The Contractor will be responsible for all activities inside this construction island, including health and safety. The Contractor shall coordinate their work with ONTC to ensure that disruption to work being done by ONTC employees in the area outside of the construction island is not interrupted. Access by the Contractor will be restricted to the work area (construction island) only.

9. The Contractor shall establish a site-use plan acceptable to ONTC providing an organized, safe, and efficient means of personnel transport, material handling, storage/laydown areas, construction trailer locations, access points and methods of access, and limits of construction within the premises.

10. The Contractor shall clean up and demobilize areas upon completion of the work.

11. The Contractor shall supply all necessary tools, machinery, and equipment to perform the work including, but not limited to, forklifts, mobile cranes, hoisting equipment, scaffolding, ladders, man lifts, temporary lighting, heating, welding machines, ventilation, consumables, and any other material or equipment required to complete the work. The Contractor shall provide all necessary vehicles and qualified personnel to transport people and materials.

12. The Contractor shall remove all demolished material from ONTC property and pay for all disposal fees, with the exception of excavated material.

13. The Contractor will have access to the construction island, 24 hours per day, seven days per week. The Contractor will be required to coordinate their hours of work with ONTC and maintain a record of all persons accessing the site that at a minimum includes the name of the person, time-in, time-out and their site contact with the Contractor.

14. Supply all personal protective equipment (PPE) and consumable supplies as required to meet all applicable legislation, ONTC policies and Contractor Policies.

    Note: Safety glasses with side shields, safety boots, hard hats, and high visibility clothing must be worn at all times on ONTC property. Any employees not wearing the required PPE will be immediately escorted off ONTC property.

15. Designate a site supervisor who will be responsible for managing the project and be responsible for on-site safety, including all sub-contractors and suppliers. This site supervisor will be the single point of contact for the duration of the project. This site supervisor will be required to communicate with ONTC supervision to ensure the work is completed safely with minimal impact on the operation of the facility.

16. Purchase and deliver to the site all Contractor supplied materials, equipment, facilities, and manpower necessary to accomplish the work within the schedule.

17. The Contractor shall be aware of all high voltage equipment. Be familiar with proper equipment shut down procedures and follow “Lock Out and Tag Out” procedures.

18. Provide regular updates to ONTC project manager, including daily progress reports.

19. Any changes or deviation must be agreed to and approved by ONTC.

20. When working around railway tracks, the Cochrane rail operations must be notified. All blue signal and flags procedures must be followed.

21. All Engineered Drawings, shop drawings, submittals/approvals, RFI’s and schedule changes must be submitted through AutoDesk Construction Cloud which is set up and provided by ONTC.

B. MATERIAL DISCLOSURES

1. Examination of Site

Proponents are required to satisfy themselves as to existing conditions of the site and must take all site conditions into account in preparing their proposals.

2. Contractor Health and Safety

The successful proponent must be familiar and comply with the Occupational Health and Safety Act (OHSA) and ONTC’s Policies.

3. Liquidated Damages

The per diem rate calculated in relation to Article A-10.4 of the Contract is $1,000 for each calendar day of delay beyond the prescribed date for Ready-for-Takeover until Ready-for-Takeover is achieved and certified, pursuant to the terms of the Contract.

C. MANDATORY SUBMISSION REQUIREMENTS

1. Submission Form (Appendix C)

Each proposal must include a Submission Form (Appendix C) completed and signed by an authorized representative of the proponent.

2. Pricing

Each proposal must include pricing information that complies with the instructions set out below in Section G of this Appendix B.

3. Bid Security

3.1 Proponents shall provide with their Bid, Bid Performance Security in one of the following forms:

(a) Irrevocable stand-by Letter of Credit ("**LOC**"); or

(b) Bid bond

(the "**Bid Performance Security**").

The Bid Performance Security shall be:

(a) in the Proponent's own name;

(b) if a bid bond, issued by a surety licensed to conduct surety and insurance business in Ontario;

(c) in a form satisfactory to ONTC;

(d) for a term of at least ninety (90) calendar days after the submission deadline; and

(e) in the amount of ten percent (10%) of the total bid price excluding HST.

The Bid Performance Security is for the benefit of ONTC and will be retained by ONTC to compensate ONTC for the damages it will suffer if the successful proponent fails to provide the Contract Securities (defined in Section 3.2, below) and evidence of insurance and other documents required by this RFT or by the final agreement, or fails to execute the final agreement within the time required by the RFT documents.

The Bid Performance Security of the successful proponent will be returned after the successful proponent delivers to ONTC compliant Contract Securities and evidence of insurance and other documents required by this RFT or by the final agreement and the successful proponent has executed the final agreement, all within the time required by the RFT documents.

The Bid Performance Security of all other proponents shall be returned to the proponents upon the occurrence of the earlier of:

(a) execution by both parties of the final agreement between ONTC and the successful proponent;

(b) the expiry of the 90-day period following the submission deadline;

(c) the cancelation of the RFT process without an award of the contract; or

(d) the disqualification of all Bids.

3.2 Agreement to Bond

The proponent shall provide with its bid an agreement to bond issued by a surety company undertaking to provide a fifty percent (50%) Performance Bond and a fifty percent (50%) Labour and Material Bond (the "Contract Securities") in the form prescribed by the *Construction Act*, both to be provided to ONTC by the successful proponent following award of the contract.

3.3 Bids not accompanied by the required Bid Performance Security and the required agreement to bond will be declared non-compliant.

3.4 The proponent shall include the actual cost of all bonds, with no mark-up, in the Price.

4. Other Mandatory Submission Requirements

Not Applicable.

D. MANDATORY TECHNICAL REQUIREMENTS

Not Applicable.

E. PRE-CONDITIONS OF AWARD

The selected bidder must satisfy the following conditions and provide the following information with ten (10) days of the notice of selection:

(a) The performance bond and the labour and material bond described in the RFP Documents. The form of such bonds shall comply with the requirements prescribed in the *Construction Act*. Refer to the link below for the appropriate form (Form 31 and 32).

https://ontariocourtforms.on.ca/en/construction-lien-act-forms/

(b) Certificates of insurance as specified in the Supplementary Conditions; and

(c) A current Clearance Certificate issued by the Workplace Safety and Insurance Board, if applicable.

F. EVALUATION CRITERIA

The following sets out the categories, weightings, and descriptions of the rated criteria of the RFP. Proponents who do not meet a minimum threshold score for a category will not proceed to the next stage of the evaluation process.

Item	Criteria	Weighting	Minimum Threshold
1. TECHNICAL PROPOSAL			
1.0	**Category 1: Experience and Qualifications**	**35**	**17.5**
1.1	Company Profile	10	
1.2	Project Team	10	
1.3	Project Profiles	15	
2.0	**Category 2: Schedule and Methodology**	**35**	**17.5**
2.1	Schedule and Methodology	15	
2.2	Proposed Approach & Narrative	20	
3.0	**Category 3: Health, Safety and Environmental**	**8**	**n/a**
3.1	Health, Safety & Environmental	8	
	Total	**78**	
50% Minimum Threshold to be obtained in Category 1 (17.5/35) and Category 2 (17.5/35) to Proceed to Stage 2 - Pricing Proposal. Proposals which do not meet these minimum thresholds may not be considered further.			
2. PRICING PROPOSAL			
	Pricing	**30**	**n/a**
3. DOMESTIC SUPPLY CHAIN			
	Domestic Supply Chain Plan The Domestic Supply Chain Plan is evaluated as a rated criterion worth 10% and forms part of the proponent's total evaluation score out of 120 points.	**12**	
	Total Points	**120**	

The ranking of proponents will be based on the total score calculated by adding the technical proposal points, pricing points, and Domestic Supply Chain Plan points.

Technical Proposal Content Requirements

The proponent shall provide a written proposal in PDF format.

The proposal to undertake the project shall include a clear outline, including the general items listed below, but also include other considerations based on the proponent's understanding of the project. Failure to provide the requested information will negatively affect the scoring of the proposal in the evaluation process.

All submissions shall utilize the headings in the Technical Proposal Requirements table provided below, and in the order presented, which align with the Evaluation Criteria. All submissions shall also address the information requirements under each heading. Pricing is not to be provided in the Technical Proposal.

ITEM #	DESCRIPTION
	Title Page
	Table of Contents
1.0	**Experience and Qualifications**
1.1	Proponents shall include a Company Profile providing a high-level overview of their company, including the number of years your company has provided services similar to the scope of work in this RFP. Please describe your company's history, office locations, and corporate operating philosophy and description of the specific services and specialties offered. Proponents must demonstrate a **minimum of ten (10) years** of experience with projects similar in scope. Proponents shall demonstrate experience in design-build electrical projects and particularly: transformer replacements, medium/high voltage systems, switchgear retrofits and breaker replacements. Proponents shall also demonstrate experience working in live operational environments without service interruption. *Proponents shall also include company profiles for any and all Subcontractors being used for the completion of the project.*
1.2	Proponents shall provide an organizational chart and full detailed resumes of all personnel involved in the project, including the roles listed below. Details of the roles and responsibilities of the proponent and any of its agents, employees, and sub-contractors who will be involved in providing the deliverables, together with the identity of those who will be performing those roles and their relevant respective expertise, including proof of qualifications, certifications, and licenses (P.Eng, Master Electrician). Proponents must demonstrate that the engineers working on this project shall have a **minimum of eight (8) years** of experience and be registered to practice in the province of Ontario. The key resource team shall include a Site Supervisor. The key personnel must be made available for the full term of the Contract. A succession plan must be established by the Contractor to ensure optimal management of the project in the event of temporary or permanent absence of the Site Supervisor without jeopardizing project activities.

	Proponents must designate named individuals for each of the following key personnel roles and provide a brief description identifying the role and responsibilities of each key personnel, with respect to the below services requested, together with their respective resumes: **Site Supervisor** Key Responsibilities: The Site Supervisor will be responsible for managing the project and be responsible for on-site safety, including all sub-contractors and suppliers. This site supervisor will be the single point of contact for the duration of the project. This site supervisor will be required to communicate with ONTC supervision to ensure the work is completed safely with minimal impact on the operation of the facility Experience/Qualifications: Must have a minimum of five (5) years' experience in similar projects and hold a valid Electrical Contractor's License. **Quality Control & Testing** Key Responsibilities: The Quality Control & Testing Technician will be responsible for testing, inspecting, and commissioning electrical systems. This technician will also be responsible for ensuring compliance with NETA standards, codes, and project specs. This technician will also be responsible for validating system performance before energization and during operation, in addition to providing reports confirming systems meet quality and safety requirements. Experience/Qualifications: Must be have a minimum of five (5) years' experience in similar projects and hold a Qualified Low Voltage and High Voltage Technologies with NETA Certification *Note: Personnel listed in the proposal must be the individuals actually assigned to the project; any substitutions following contract award are subject to prior written approval from ONTC.*
1.3	Proponents shall provide a minimum of three (3) relevant projects that have been completed in the last five (5) years. Provide examples of projects similar in scope, size and value (i.e. transformer replacement, breaker retrofit, live changeover) that demonstrate ability to execute turnkey delivery, manage long-lead equipment procurement and where you managed risks such as ongoing site operations during electrical cutover. The project descriptions shall include: a) Company/Client name b) Name of Contact and contact details

	c) Project name and scope d) Value of project at kick-off and project value upon Ready-for-Takeover e) Start and end date at project kick-off and achieved project end date upon Ready-for-Takeover f) Description of work performed and use of subcontractors g) Outcomes (e.g., completed on schedule/budget) *ONTC may, in its sole discretion, confirm the Proponent's experience in the projects identified by contacting the named contacts above.*
2.0	**Schedule, Proposed Approach & Methodology**

2.1	Proponents shall submit their Schedule in Gantt Chart Format and demonstrate that all milestone dates and completion dates align with the deliverables as detailed below.
	
	Proponents are required to provide a detailed schedule that includes:
	
	• Equipment procurement timeline, demonstrating ability to:
	  o Order transformer and breakers within FY ending March 2027
	  o Account for long lead times
	• Engineering and design milestones (50% and 100% submissions)
	• Construction schedule targeting **Summer 2027 execution**
	• Planned commissioning and testing activities
	• Critical path identification and risk mitigation measures
	• Strategy for minimizing outage duration using APU backup system
	• Payment milestone alignment with procurement and construction phases
	
	Proponents are required to identify the critical path within their Schedule and provide a corresponding description. The critical path narrative must align directly with, and support, the submitted Schedule.
	
	Note: The dates provided below do not list all milestones for this project. They are provided in order to meet ONTC's high-level deadlines. Proponents are responsible for adding additional stages and aligning their schedules accordingly.
	
	• Completion of engineering/design work and equipment procurements: March 31, 2027
	• Project Start Date: May 1, 2027
	• Final Completion Date: September 30, 2027

2.2	Proponents shall provide a comprehensive written narrative outlining their proposed approach for the completion of the project. The narrative should be clear, logical, and

include sufficient detail with estimated durations for each task. Proponents shall demonstrate how they will minimize disruptions to ongoing operations.

Proponents must demonstrate how their proposed solution aligns with the provided phased approach while ensuring practical operability. They are expected to apply their expertise to recommend improvements and identify what will work best in real-world conditions. Submissions should reflect consideration of operational efficiency, usability, and long-term sustainability.

The Proposed Approach and methodologies must address the following priorities in alignment with the proposed schedule:

Design and Engineering Approach

- Methodology for reviewing existing drawings, reports and site conditions
- Approach to updating: Arc Flash Study, Coordination Study, Single Line Diagram
- Process for design submissions, reviews and approvals

Procurement Strategy

- Transformer and breaker sourcing strategy
- Vendor qualifications and compliance with required specifications
- Risk mitigation for supply chain delays

Construction and Installation Approach

- Step-by-step plan for:
    - Removal and disposal of existing transformer
    - Installation of new transformer and primary cable/conduit
    - Switchgear retrofit and breaker replacement
- Methodology for maintaining continuous operations during switchover
- Coordination with utility and stakeholders

Testing and Commissioning

- Compliance with:
    - CSA standards (FAT and routine testing)
    - NETA ATS standards (site testing)
    - IEEE 80 and 81 (ground grid testing)
- Commissioning procedures and documentation

	Risk Management
	
	• Identification of key risks:
	  ○ Equipment lead times
	  ○ Operational disruptions
	  ○ Site constraints
	• Mitigation strategies

3.0	**Health, Safety and Environmental**
3.1	Proponents shall complete the Contractor Health and Safety Responsibility Agreement and the Contractor Safety Pre-Qualification Form attached at **Appendix F** and provide the following associated supporting documents: • WSIB Safety Record • Safety Records of the Organization • Health, Safety and Environmental Protection Policy Proponents must demonstrate a strong commitment to safety and environmental protection, including: • Compliance with Ontario Occupational Health and Safety Act (OHSA) • Experience working in high-voltage electrical environments • Lock-out/tag-out procedures and energized system protocols • Environmental management practices (e.g., handling and disposal of transformer oil, contaminated materials) • Incident reporting and safety performance metrics (TRIF, LTIF, etc.) • Site-specific safety plan approach *Proponents must pass the Contractor Safety Pre-Qualification. Failure to pass may result in disqualification from the procurement process.*

G. PRICE EVALUATION METHOD

Pricing is worth **30 points** of the total score.

Pricing will be scored based on a relative pricing formula using the rates set out in the pricing form. Each proponent will receive a percentage of the total possible points allocated to price, which will be calculated in accordance with the following formula:

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

Instructions on How to Provide Pricing

(a) Proponents should submit their pricing information by completing the attached pricing form and including it in their proposals.

(b) Rates must be provided in Canadian funds, inclusive of all applicable duties and taxes except for HST, which should be itemized separately.

(c) Unless otherwise indicated in the requested pricing information, rates quoted by the proponent must be all-inclusive and must include all labour and material costs, all travel and carriage costs, all insurance costs, all costs of delivery, all costs of installation and set-up, including any pre-delivery inspection charges, and all other overhead, including any fees or other charges required by law.

Required Pricing Information

Please complete Schedule A - Schedule of Prices which is attached at Appendix D.

H. DOMESTIC SUPPLY CHAIN PLAN

Proponents must submit a Domestic Supply Chain Plan that outlines the source of each major good or service proposed to be used to deliver the project, including those supplied by subcontractors. Proponents must indicate which major goods are Ontario-Made, Canadian-Made, or sourced elsewhere, and whether the services are Ontario or Canadian Services.

The Domestic Supply Chain Plan will be evaluated as part of the RFP evaluation process in accordance with the Capital Infrastructure requirements of the Buy Ontario Procurement Directive.

The Domestic Supply Chain Plan accounts for 10% of the total available evaluation points. The evaluation will consider domestic supply chain content, with emphasis on Ontario-Made Goods and Ontario Services, followed by Canadian-Made Goods and Canadian Services, in accordance with the Capital Infrastructure requirements of the Buy Ontario Procurement Directive.

Each Domestic Supply Chain Plan will be assessed to determine the proportion of the total procurement value represented by Ontario and Canadian content. The resulting Domestic Supply Chain Plan score will be added to the proponent's technical and price scores to arrive at a total evaluation score.

Where a proponent does not have the highest total evaluation score, ONTC may nonetheless award the Contract to that proponent provided that all of the following conditions are met:

- the proponent's Domestic Supply Chain Plan score is at least 50% higher than that of the top-ranked proponent;
- the proponent's bid price is within 10% of the top-ranked proponent's bid price;
- the proponent's proposed construction schedule is no more than 10% longer than that of the top-ranked proponent; and
- the proponent's submission is otherwise compliant with all mandatory requirements of the RFP.

The Domestic Supply Chain Plan evaluation is intended to support Ontario and Canadian supply chains while maintaining value for money and competitive procurement outcomes. The actual Contract pricing shall remain as submitted and will not be adjusted as a result of the evaluation.

To determine the Domestic Supply Chain Plan score, the calculation needs the following information:

- A = Proportion of the total procurement value represented by Ontario-Made Goods and Ontario Services
- B = Proportion of the total procurement value represented by Canadian-Made goods and Canadian Services

The Domestic Supply Chain Plan score is calculated by comparing each proponent's combined Ontario and Canadian content (A + B) as a proportion of the total procurement value, scaled to the maximum 10 points available.

Applying Domestic Supply Chain Plan Advantage – Example

	Total Bid price	Ontario	**A** Proportion Ontario	Canadian	**B** Proportion Canadian	A+B	Supply Chain Plan Score (10 pts)
Bidder 1	$9,000,000	$1,800,000	20%	$900,000	10%	30%	3.00
Bidder 2	$9,700,000	$1,940,000	20%	$2,425,000	25%	45%	4.50
Bidder 3	$9,500,000	$2,850,000	30%	$2,850,000	30%	60%	**6.00**

	Bidder 1	**Bidder 2**	**Bidder 3**
Evaluation of the Rated Criteria (60 pts)	58	47	50
Evaluation of Pricing (30 pts)	30	27.84	28.42
Domestic Supply Chan Plan (10 pts)	3	4.5	6
Total (100 pts)	91	79.34	84.42
Construction Schedule	Duration: 1,399 days	Duration: 1,369 days	Duration: 1,530 days
Results	Bidder 1 is highest ranked bidder		Bidder 3 has the highest Domestic Supply Chain Plan Score

In this example, Bidder 3 does not have the highest total score (84.42 vs. 91), but can be awarded the contract after applying the Domestic Supply Chain Scoring adjustments because:

- their Domestic Supply Chain Plan score (6/10) is at least 50% higher than the top-ranked bidder's Supply Chain Score (3/10)
- their bid price is within 10% of the top-ranked bidder's price
- their bid is compliant; and
- their Construction Schedule is not more than 10% longer than Bidder 1's.

APPENDIX C - SUBMISSION FORM

1. **Proponent Information**

Please fill out the following form, naming one (1) person to be the proponent's contact for the RFP process and for any clarifications or communication that might be necessary.	
Full Legal Name of Proponent:	
Any Other Relevant Name under which Proponent Carries on Business:	
Street Address:	
City, Province:	
Postal Code:	
Phone Number:	
Company Website (if any):	
Proponent Contact Name and Title:	
Proponent Contact Phone:	
Proponent Contact Email:	

2. Sub-Contractors

The proponent shall state all Subcontractor(s) and type of Work proposed to be used for this project. Proponents shall not indicate "TBD" (To Be Determined) or "TBA" (To Be Announced) or similar wording and shall not indicate multiple choices of Subcontractor names for any Subcontractor category in their list of Subcontractors.

List of Sub-Contractors

In the spaces provided below, please list those subcontractors you intend to use:

☐ By checking this box, I confirm that there are no Subcontractor(s) and the proponent shall perform the project with their "**OWN FORCES**".

Item	***Organization***	***Contact Name***	***E-mail***	***Phone***
1				
2				
3				
4				
5				

3. Bill S-211

ONTC adheres to, and reports under the Government of Canada's Bill S-211 Fighting against Forced Labour and Child Labour in Supply Chains Act.

1. Is your company required to report under the Government of Canada's Bill S-211 Fighting against Forced Labour and Child Labour in Supply Chains Act? Yes ☐ No ☐

2. Is your company compliant with the Government of Canada's Bill S-211 Fighting against Forced Labour and Child Labour in Supply Chains Act? Yes ☐ No ☐

3. Has your company been involved in forced and/or child labour in the past? Yes ☐ No ☐
If yes, please provide details including date and action taken to mitigate.

_____
_____
_____
_____
_____

4. Procurement Restriction

"U.S. business" means a supplier, manufacturer or distributor of any business structure (including a sole proprietorship, partnership, corporation or other business structure) that:

i. has its headquarters or main office located in the U.S., and
ii. has fewer than 250 full-time employees in Canada at the time of the applicable procurement process.

If a proponent is a subsidiary of another corporation, part 1 of the definition above is met if that proponent is controlled by a corporation that has its headquarters or main office located in the U.S.

Please select one of the following statements that describes your organization:

☐ Yes, my organization is a "U.S. business" as defined above.
☐ No, my organization is not a "U.S. business" as defined above.

If a proponent responded "Yes", then does the proponent commit that at least 90 percent of the staff required to deliver the contracted services will be located in Canada and that this level will be maintained for the term of the contract?

☐ Yes
☐ No

If the proponent has not demonstrated eligibility with a "Yes" response to the staffing commitment, ONTC reserves the right, in its sole discretion, to disqualify the proponent.

5. Offer

The proponent has carefully examined the RFP documents and has a clear and comprehensive knowledge of the Deliverables required under the RFP. By submitting a proposal, the proponent agrees and consents to the terms, conditions, and provisions of the RFP, including the Form of Agreement, and offers to provide the Deliverables in accordance therewith at the rates set out in its proposal.

6. Rates

The proponent has submitted its rates in accordance with the instructions in the RFP. The proponent confirms that it has factored all of the provisions of Appendix A, including insurance and indemnity requirements, into its pricing assumptions and calculations.

7. Addenda

The proponent is deemed to have read and accepted all addenda issued by ONTC prior to the Deadline for Issuing Addenda. The onus is on proponents to make any necessary amendments to their proposals based on the addenda.

8. Communication with Competitors

For the purposes of this RFP, the word "competitor" includes any individual or organization, other than the proponent, whether or not related to or affiliated with the proponent, who could potentially submit a response to this RFP.

Unless specifically disclosed below under Disclosure of Communications with Competitors, the proponent declares that:

(a) it has prepared its proposal independently from, and without consultation, communication, agreement, or arrangement with any competitor, including, but not limited to, consultation, communication, agreement, or arrangement regarding:

(i) prices;
(ii) methods, factors, or formulas used to calculate prices;
(iii) the quality, quantity, specifications, or delivery particulars of the Deliverables;
(iv) the intention or decision to submit, or not to submit, a proposal; or
(v) the submission of a proposal which does not meet the mandatory technical requirements or specifications of the RFP; and

(b) it has not disclosed details of its proposal to any competitor and it will not disclose details of its proposal to any competitor prior to the notification of the outcome of the procurement process.

Disclosure of Communications with Competitors

If the proponent has communicated or intends to communicate with one (1) or more competitors about this RFP or its proposal, the proponent discloses below the names of those competitors and the nature of, and reasons for, such communications:

_____

_____

_____

_____

_____

_____

9. No Prohibited Conduct

The proponent declares that it has not engaged in any conduct prohibited by this RFP.

10. Conflict of Interest

The proponent must declare all potential Conflicts of Interest, as defined in Section 3.4.1 of the RFP. This includes disclosing the names and all pertinent details of all individuals (employees, advisers, or individuals acting in any other capacity) who (a) participated in the preparation of the proposal; **AND** (b) were employees of ONTC within twelve (12) months prior to the Submission Deadline.

If the box below is left blank, the proponent will be deemed to declare that (a) there was no Conflict of Interest in preparing its proposal; and (b) there is no foreseeable Conflict of Interest in performing the contractual obligations contemplated in the RFP.

Otherwise, if the statement below applies, check the box.

- ❑ The proponent declares that there is an actual or potential Conflict of Interest relating to the preparation of its proposal, and/or the proponent foresees an actual or potential Conflict of Interest in performing the contractual obligations contemplated in the RFP.

If the proponent declares an actual or potential Conflict of Interest by marking the box above, the proponent must set out below details of the actual or potential Conflict of Interest:

_____

_____

_____

_____

11. Disclosure of Information

The proponent hereby agrees that any information provided in this proposal, even if it is identified as being supplied in confidence, may be disclosed where required by law or by order of a court or tribunal. The proponent hereby consents to the disclosure, on a confidential basis, of this proposal by ONTC to the advisers retained by ONTC to advise or assist with the RFP process, including with respect to the evaluation this proposal.

12. Proposal Irrevocable

The proponent agrees that its proposal shall be irrevocable for the Irrevocability Period specified in the RFP, running from the moment the Submission Deadline has passed.

13. Execution of Agreement

The proponent agrees that in the event its proposal is selected by ONTC, in whole or in part, it will finalize and execute the Agreement in the form set out in Appendix A to this RFP in accordance with the terms of this RFP.

14. Travel

To the extent that travel expenses are expressly provided for under the written agreement for the Deliverables, the proponent hereby acknowledges that travel expenses must be approved in advance by ONTC and must be in compliance with the Management Board of Cabinet Travel, Meal & Hospitality Expenses Directive, January 2020 (https://www.ontario.ca/page/travel-meal-and-hospitality-expenses-directive)."

Signature of Proponent Representative

Name of Proponent Representative

Title of Proponent Representative

Date

I have the authority to bind the proponent.

APPENDIX D - SCHEDULE OF PRICES

Please refer to the separate Appendix D - Schedule of Prices excel worksheet. This form must be completed as part of the proposal.

1. SCHEDULE A - COST BREAKDOWN

Proponents shall complete the Schedule A - Cost Breakdown as provided.

2. DOMESTIC SUPPLY CHAIN PLAN

Proponents shall complete the table provided in the separate Excel Sheet and submit as part of their proposals, in order to identify the source and value of major goods and services required for the project, including those supplied by subcontractors. Indicate whether each Good is Ontario Made, Canadian Made, or from another jurisdiction (elsewhere) and indicate whether each Service is an Ontario Service, Canadian Service or elsewhere.

Proponents shall not include overhead, profit, general conditions, or any indirect costs in the Domestic Supply Chain Plan pricing table. Only the direct dollar value of major goods and services is to be entered. The total value reported in the Domestic Supply Chain Plan will not equal the Total Project Cost and is not intended to reconcile to the bid price. Proponents shall not adjust values for the purpose of aligning this table with their total bid.

Definitions:

"Canadian Business" means a supplier, manufacturer or distributor of any business structure that conducts its activities on a permanent basis in Canada. The business either:

i. has its headquarters or main office in any province or territory within Canada, or
ii. has at least 250 full-time employees in any one province or territory within Canada at the time of the applicable procurement process.

"**Canadian Made**" means the product originates from any one province or territory within Canada - either grown, produced, or manufactured in Canada.

"**Canadian Service**" means any service provided by an individual or a supplier, manufacturer or distributor of any business structure based in Canada.

"Ontario Business" means a supplier, manufacturer or distributor of any business structure that conducts its activities on a permanent basis in Ontario. The business either,

i. has its headquarters or main office in Ontario, or
ii. has at least 250 full-time employees in Ontario at the time of the applicable procurement process.

"**Ontario Made**" means the product originates from Ontario - either grown, produced, or manufactured in Ontario.

"**Ontario Service**" means any service provided by an individual or a supplier, manufacturer or distributor of any business structure based in Ontario.

Example:

Example of Domestic Supply Chain Table

Item Description	Origin (Ontario, Canada, elsewhere)	Dollar Value (CAD)
Example: Concrete	**Ontario**	**$50,000.00**
Example: Steel	**Canada**	**$30,000.00**
Example: Fixtures	**Other**	**$10,000.00**

3. PRICING FOR CHANGE ORDERS / CHANGE DIRECTIVES

Proponents shall quote overhead and profit percentages based on the project cost ranges included in the table provided.

Proponents shall also provide the hourly rates of pay for the listed positions in the table provided.

4. SCHEDULE OF PROGRESS PAYMENTS

Proponents shall provide their Schedule of Progress Payments in the table provided.

APPENDIX E - MANDATORY SITE VISIT

A. Mandatory Meeting Registration Form

Reference Number: RFP 2026 045

Title: Cochrane Outdoor Electrical Distribution Upgrade

Submitted To: ONTARIO NORTHLAND TRANSPORTATION COMMISSION

Please confirm that you plan to attend the Mandatory Site Visit by emailing a completed copy of this **Registration Form and Release of Liability** to nicole.laplante@ontarionorthland.ca, prior to Wednesday, June 24, 2026 at 4:00 p.m.

Failure to submit this form by the time required may result in ONTC not being able to accommodate your attendance.

Proposals submitted by proponents that failed to attend the Mandatory Site Visit will be declared non-compliant and will be rejected.

Date of Meeting: Thursday, June 25, 2026

Time of Meeting: 11:00 a.m.

Location: 326 Second Street, Cochrane, ON

COMPANY NAME: _____

CONTACT NAME: _____

ADDRESS: _____

_____

TELEPHONE: _____

EMAIL: _____

NUMBER OF PERSONS ATTENDING: _____

PLEASE BRING THE FOLLOWING PERSONAL PROTECTIVE EQUIPMENT: SAFETY BOOTS, REFLECTIVE VEST, HARD HAT, AND SAFETY GLASSES WITH SIDE SHIELDS

ACCOMMODATION: ONTC is an equal opportunity organization. Accommodation is available for proponents with disabilities throughout the procurement process. If accommodation is REQUIRED, please contact **nicole.laplante@ontarionorthland.ca** .

NOTE: THE ATTACHED RELEASE OF LIABILITY WILL BE REQUIRED TO BE EXECUTED BY ANY PERSONS ATTENDING THE SITE MEETING PRIOR TO ATTENDANCE.

B. Release of Liability Form

RELEASE OF LIABILITY
IN RESPECT OF ENTERING AND WORKING UPON
ONTARIO NORTHLAND TRANSPORTATION COMMISSION PROPERTY

The undersigned applicant requests permission of Ontario Northland Transportation Commission (hereinafter referred to as "ONTC") to enter on ONTC property to attend a mandatory site visit commencing at 11:00 a.m. on Thursday, June 25, 2026, in Cochrane, Ontario, associated with RFP 2026 045.

In consideration of ONTC permitting the Applicant and his/her/its employees, servants and agents to enter ONTC property for the purpose of the site meeting, the Applicant agrees it shall:

1. follow all instructions and directions from ONTC representatives while on ONTC property;
2. be liable for any and all damages to persons or property which may arise out of or be connected with the Applicant's entry on ONTC property, and the Applicant agrees to indemnify ONTC against any and all actions, suits, claims, damages, costs, liability and expenses which may arise by reason of the Applicant's operations while on ONTC property.
3. fully indemnify and save harmless ONTC, its officers, directors, employees, consultants, sub consultants, contractors, and agents (collectively “ONTC Indemnitees”) from any kind of liability, suit, claim, demand, fine, action, loss, damage, legal cost and disbursement, or for which ONTC or ONTC Indemnities may become liable or suffer in connection with the Applicant’s entry on ONTC property. For the purposes of this indemnity, ONTC is acting as the trustee of the ONTC Indemnitees. This indemnity section will survive the expiry of this permission;
4. enter on ONTC property at the sole cost, risk and expense of the Applicant; and,
5. release and discharge ONTC, its employees, servants and agents of and from any and all claims and demands of whatever nature and howsoever caused by reason of any loss, damage or injury to person or property which the Applicant or its employees, servants and agents may sustain or suffer while on ONTC property.

DATED AT _____ THIS _____ DAY OF_____, 2026.

Applicant _____ Witness _____

APPENDIX F - HEALTH, SAFETY AND ENVIRONMENTAL

Proponents shall review and complete the Contractor Health and Safety Responsibility Agreement and Contractor Safety Pre-Qualification Form and attach with their submissions.

A. Contractor Health and Safety Responsibility Agreement

In submitting this Proposal, I/We, on behalf of, _____
(legal name of company)

certify the following:

(a) I/We have a health and safety policy and will maintain a program to implement such policy as required by clause 25(2) (j) of the *Occupational Health and Safety Act*, R.S.O. 1990, c.O.1, as amended, (the "OHSA").

The requirements in (a) do not apply to employers with five (5) or less employees.

(b) With respect to the Services being offered in this Proposal, I/We and on behalf of our proposed sub-consultants, acknowledge the responsibility to, and shall:

(i) fulfill all of the obligations under the OHSA and ensure that all work is carried out in accordance with the OHSA and its regulations;

(ii) ensure that adequate and competent supervision is provided as required under the OHSA to protect the health and safety of workers; and

(iii) provide information and instruction to all employees to ensure they are informed of the hazards inherent in the work and understand the procedures for minimizing the risk of injury or illness.

(c) I/We agree to take precautions reasonable in the circumstances for the protection of worker health and safety, as required under the OHSA.

Dated at _____ this _____ day of _____, 202_.

An Authorized Signing Officer _____

(Key Contact)

(Title) _____

(Telephone Number) _____

(Firm's Name) _____

(Firm's Address) _____

B. Contractor Safety Pre-Qualification Form

1. Company Identification:				ONTC Use
Company Name:		Telephone :		
Mailing Address:		Fax:		
		E-mail:		
2. Form of Business:				
☐ Sole Proprietor	☐ Partnership:	☐ Corporation		
3. Officers:		Years with the Company		
President / CEO				
Vice President				
Treasurer				
Who is the manager most responsible for health and safety?				
Name:		Title:		
4. How many years has your business operated under its current name?				
5. Under Current Management Since (Date)				
6. Parent Company Information				
Parent Name:				
City:	Province / State:	Postal / Zip Code:		
Subsidiaries:				
7. Insurance Contact Information				
Title:	Telephone:	Fax:		
Insurance				
8. Carriers:	Type of Coverage:	Telephone		
9. Organization:				
Describe the nature of the work your company specialized in:				
☐		☒		
☐		☐		
☐		☐		
☐		☐		

☐	☐		
10. Are any of the above services that you perform normally subcontracted to others?	☐ Yes	☐No	
11. Health and Safety Performance			
a) Are any of the above services that you perform normally subcontracted to others?	☐ Yes	☐ No	
b) Can you provide a Workplace Safety & Insurance Clearance Certificate?	☐ Yes	☐ No	
c) Has an employee of your company suffered a fatal accident or "critical injury" as defined by the *Ontario Occupational Health & Safety Act*? Please provide for the last 3 years: i) total number of lost time accidents by rate group, ii) total number medical aid accidents, iii) total number of hours worked by each rate group	☐ Yes	☐ No	
d) Has your company ever been subjected to a Workwell Audit? If yes, what was your final score? _____	☐ Yes	☐ No	
e) Are there judgements, claims or suits pending or outstanding against your company?	☐ Yes	☐ No	
f) Have you received any regulatory (MOL, MOE, etc.) orders and/or prosecutions in the last 3 years? If yes, provide details of all prosecution and fines for the past 3 years on a separate sheet.	☐ Yes	☐ No	
g) Do you have involvement in provincial safety associations such as the Infrastructure Health & Safety Association (IHSA) and/or Workplace Safety & Prevention Services (WSPS)? If yes, please name:	☐ Yes	☐ No	

12. Health and Safety Program and Procedures:

a) Do you have a written health and safety policy? If yes, include a copy.	☐ Yes	☐ No	
b) Do you have a written health and safety program?	☐ Yes	☐ No	
c) If so, are the following elements addressed?	☐ Yes	☐ No	
i. Participation by all levels in the organization	☐ Yes	☐ No	
ii. Accountabilities & responsibilities for managers, supervisors and employees	☐ Yes	☐ No	
iii. Adequate resourcing for meeting health and safety requirements	☐ Yes	☐ No	
iv. Hazard identification and control	☐ Yes	☐ No	
v. Health and safety performance measurement and evaluation	☐ Yes	☐ No	
vi. Corrective actions implementation	☐ Yes	☐ No	

13. Health and Safety Program: Does the health and safety program include procedures and practice documents such as:

a) Hazardous Energy Control, Lock-out – Tag-out	☐ Yes	☐ No	
b) Confined Space Entry	☐ Yes	☐ No	

c) Working at Heights, Fall Protection	☐ Yes	☐ No	
d) Personal Protective Equipment (PPE)	☐ Yes	☐ No	
e) Portable / Electric Power Tools			
f) Vehicle Safety	☐ Yes	☐ No	
g) Compressed Gas Cylinders	☐ Yes	☐ No	
h) Electrical Equipment Grounding Assurance	☐ Yes	☐ No	
i) Powered Industrial Vehicles (forklifts, cranes, etc.)	☐ Yes	☐ No	
j) Heavy Construction Equipment (excavators, backhoes, bulldozers, etc.)	☐ Yes	☐ No	
k) Excavation and Trenching	☐ Yes	☐ No	
l) Housekeeping	☐ Yes	☐ No	
m) Accident / Incident Reporting and Investigation	☐ Yes	☐ No	
n) Hazard / Unsafe Condition Identification, Reporting and Communication	☐ Yes	☐ No	
o) Workplace Hazardous Materials information System (WHMIS)	☐ Yes	☐ No	
p) Emergency Action Plan / Evacuation Plan	☐ Yes	☐ No	
q) Spill Response / Reporting	☐ Yes	☐ No	
r) Respiratory Protection	☐ Yes	☐ No	
s) Designated Substances Management	☐ Yes	☐ No	
t) Waste Staging / Disposal	☐ Yes	☐ No	
u) Traffic Control	☐ Yes	☐ No	
v) Hearing Conservation	☐ Yes	☐ No	
14. Do you have a policy/procedure for terminating contracts of subcontractors who do not comply with the requirements of the *Occupational Health & Safety Act,* associated regulations and / or company safety rules?	☐ Yes	☐ No	
15. Do your employees read, write and understand English to the degree that they can safely perform their tasks without the aid of an interpreter? (*If no, provide a description of your plan to assure that they can safety perform their tasks*)	☐ Yes	☐ No	
16. Do you have personnel certified in Emergency First Aid and CPR on site? If yes, provide copies of certificates of training for site personnel proposed for the project?	☐ Yes	☐ No	
17. Do you have First Aid kits available to your staff?	☐ Yes	☐ No	
18. Does your company use a formalized Health and Safety Plan for conducting large projects?	☐ Yes	☐ No	
19. Does the company conduct pre-placement medical examinations?	☐ Yes	☐ No	
20. Is task-adequate PPE provided to workers?	☐ Yes	☐ No	

21. Are employees trained in PPE care, use and maintenance?	☐ Yes	☐ No	
22. Do you have a corrective action process for addressing individual health and safety performance deficiencies	☐ Yes	☐ No	
23. Equipment and Manuals:			
a. Do you conduct inspections on operating equipment (e.g. excavators, cranes, forklifts, vehicles, etc.) as per regulatory requirements?	☐ Yes	☐ No	
b. Do you maintain operating equipment in compliance with regulatory requirements?	☐ Yes	☐ No	
c. Do you maintain applicable pre-use inspection and maintenance certification records for operating equipment?	☐ Yes	☐ No	
d. Are records available upon request	☐ Yes	☐ No	
24. Subcontractors			
a. Do you use health and safety performance criteria in the selection of contractors?	☐ Yes	☐ No	
b. Do you require your subcontractor to have a written health and safety program?	☐ Yes	☐ No	
c. Are your subcontractors included in	☐ Yes	☐ No	
i. health and safety orientation	☐ Yes	☐ No	
ii. health and safety meetings	☐ Yes	☐ No	
iii. workplace inspections	☐ Yes	☐ No	
iv. health and safety audits	☐ Yes	☐ No	
d. Does the company have a policy for the termination of contracts of subcontractors who do not comply with the Occupation Health and Safety Act, regulations under the Act, contractor rules, programs, protocols policies or procedures?	☐ Yes	☐ No	
e. Does the company have a progressive discipline policy for employees and subcontractors?	☐ Yes	☐ No	
25. Health and Safety Training			
a. Are you aware of the regulatory training requirements for your employees?	☐ Yes	☐ No	
b. Have your employees received the required health and safety training?	☐ Yes	☐ No	
c. Do you have specific health and safety training for supervisors?	☐ Yes	☐ No	
d. Do you keep records of health and safety training for employees?	☐ Yes	☐ No	
e. Are records of health and safety training available on request?	☐ Yes	☐ No	

26. Job Skills

a. Have employees been trained in appropriate job skills?	☐ Yes	☐ No	
b. Are employee job skills certified where required by regulation or industry standard?	☐ Yes	☐ No	
c. Are certificates available upon request?	☐ Yes	☐ No	

27. Health and Safety Supervision

a. Does the company have a health & safety coordinator?	☐ Yes	☐ No	
b. Who is the highest ranking safety professional in the company_____	☐ Yes	☐ No	

I agree that the above information is true and correct to the best of my knowledge. I also agree to follow all terms and conditions of the Contractor Safety Program at all times while performing work for ONTC. I understand that supporting documentation may be requested for due diligence verification purposes.

Name: (Please print) _____ Title: _____

Signature: _____ Date: _____

APPENDIX G - TECHNICAL SPECIFICATIONS

Refer to the Technical Specifications, as outlined below, which are attached to this Appendix G.

SECTION	TITLE
Division 00 - Procurement and Contracting Requirements	
00 31 00	Available Project Information
Division 01 - General Requirements	
01 11 00	Summary of Work
01 14 00	Work Restrictions
01 31 19	Project Meetings
01 32 00	Construction Progress Documentation
01 32 33	Photographic Documentation
01 33 00	Submittal Procedures
01 35 29.06	Health and Safety Requirements
01 52 00	Construction Facilities
01 56 00	Temporary Barriers and Enclosures
01 61 00	Common Products Requirements
01 74 00	Cleaning
01 74 19	Waste Management and Disposal
01 77 00	Closeout Procedures
01 78 00	Closeout Submittals
01 79 00	Demonstration and Training
01 91 13	General Commissioning Requirements

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 DEFINITIONS

.1 Available Project Information: information identified in this section, of any type, and in any form, and identified as Reference Documents. Available Project Information, or any part thereof, does not form part of the Contract Documents unless specifically incorporated into Contract Documents by means of copying, transcribing, or referencing, or is listed in the Agreement as a Contract Document.

.2 Contractor: synonymous with Respondent

1.03 USE AND RELIANCE UPON AVAILABLE PROJECT INFORMATION

.1 Available Project Information is made available to Respondents for the purpose of disclosing information that is available to the Consultant and Owner.

.2 Per CCDC, Available Project information is made available to Respondents to fulfill the Owner's duty to disclose all relevant Project information to Respondents.

.3 Do not consider the Available Project Information as a representation or warranty that the information is necessarily accurate, complete, or appropriate.

.4 Respondents are responsible for interpreting and forming their own conclusions about the Available Project Information, including consideration of the time the document was created. Respondents are encouraged to obtain specialist advice if necessary. The Owner and Consultant assume no responsibility for interpretations or conclusions made.

.5 In the event there is a conflict between the Contract Documents and the recommendations contained in the Available Project Information, the Contract Documents shall govern.

1.04 AVAILABLE PROJECT INFORMATION

.1 The following Available Project Information is not incorporated into the Contract Documents, but is made available to Respondents:

a. Transformer and Switchgear Shop Drawings
b. ENK-25-16358 TX testing Partial HV Maint Report
c. ENK-25-16394 – ON Cochrane Study – Study Report

.2 The following Available Project Information is incorporated into the Contract Documents:

a. CONTRACTORS WORKING ON ONTC PROPERTY

b. ONTC Contractor and Subcontractor.
c. ONTC Electrical Safety Policy and Program
d. HSP-007 – Blue Signals Flags Procedure.
e. HSP-008 Lockout Tag Out Procedure.

1.05 RELATED INSTRUCTIONS

.1 Report any irregularities or changed surface conditions at the Place of the Work to the Owner a minimum of 7 days before RFP close.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

1. Canadian Construction Documents Committee (CCDC)
   .1 CCDC 2-2020, Stipulated Price Contract.

1.02 RELATED REQUIREMENTS

.1 Refer to Specification Index for Sections applicable to this work.

1.03 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract includes the following:
   .1 Refer to APPENDIX B - RFP PARTICULARS for further details
.2 The Summary of Work provided above is for reference only:
   .1 Refer to APPENDIX B - RFP PARTICULARS for further details

1.04 SUBMITTALS

.1 Submit for review and Acceptance in accordance with Section 01 33 00 - Submittal Procedures.

.2 In addition to Submittals identified throughout the Specifications, submit the following:
   .1 Submit Project Construction Schedule in accordance with Section 01 32 16.16 - Construction Progress Schedule.
   .2 Submit site-specific Health and Safety Plan in accordance with Section 01 35 29.06 - Health and Safety Requirements.
   .3 Submit a Construction Project Management Plan, including communication, risk, and Quality Management Plans.

1.05 WORK BY OTHERS

.1 The Work under this Contract shall be performed by the Contractor.

.2 Contractor shall co-operate with other contractors retained by the Owner in carrying out their respective works and carry out instructions from the Owner and the Consultant. Refer to Contract Docuements for additional requirements.

1.06 WORK SEQUENCE

.1 Construct Work in a manner that accommodates Owner’s and public continued and/or intermittent use of premises during construction. Refer to Section 01 14 00 - Work Restrictions.

.2 Co-ordinate Construction Schedule and Owners use of premises during construction.

.3 Do not close off Owner or public usage of premises until use of one stage of Work will provide alternate usage.

.4 Maintain fire access/control.

.5 Protect workers and public safety.

.6 Work near rail tracks shall be preapproved by the Owner and completed as per Owner's procedures and policies.

1.07 CONTRACTOR USE OF PREMISES

.1 Contractor shall establish a Construction Area where the Contractor assumes the role of Constructor and will be responsible for the Construction Area until Ready for Takeover. The Contractor will be required to secure the Construction Area for the duration of the Project. The Contractor will be responsible for all activities inside the Construction Area, including health and safety. The Contractor shall coordinate the Work with the Owner to ensure that work being done by the Owner in the areas outside of the Construction Area is not interrupted. Access by the Contractor shall be restricted to the Construction Area only.

.2 In some circumstances, Contractor shall coordinate and limit its access to Construction Area to allow:

.1 Owner occupancy.

.2 Partial owner occupancy.

.3 Work by other contractors or utilities providers.

.4 Public usage.

.5 Third Party Property Owner occupancy and use.

.3 Co-ordinate use of premises under the direction of the Owner.

.4 Refer to Section 01 51 00 - Temporary Utilities, Section 01 52 00 - Construction Facilities and Section 01 56 00 - Temporary Barriers and Enclosures, for temporary facilities, access roads and parking areas, traffic regulations, and utilities.

1.08 OWNER OCCUPANCY

.1 Owner may occupy premises (adjacent buildings, railway tracks) during the entire construction period for execution of normal operations.

.2 Co-operate with the Owner in scheduling of the Work to minimize conflict and to facilitate Owner occupancy and usage of the premises.

1.09 Products Supplied by Others

.1 Contractor is responsible for receiving, unloading, if required, and handling Products Supplied by Others at the project site; setting or installing the Products in place; making any required connections to the mechanical, plumbing, electrical systems, and any other systems; and disposal of shipping or packing materials. Owner and/or Consultant and Contractor shall jointly inspect the Products for damage upon delivery to the Place of the Work. If this inspection determines that the furnished Products are damaged or defective, the Owner will arrange for the necessary replacement or repairs. Contractor is responsible for protecting the Products Supplied by Others from damage during storage and handling and is responsible for damage caused to those Products during storage and handling.

.2 Contractor to install all Products Supplied by Others in accordance with the manufacturer's installation instructions and the design Drawings, Specifications and Contract Documents.

.3 Contractor to review manufacturer's installation instructions and advise the Consultant of any discrepancies or issues in a timely manner to avoid any potential delays.

.4 Contractor to obtain manufacturer and Consultant approval before making any modification to Products Supplied by Others.

.5 Upon completion of the installation of the Products Supplied by Others, the Contractor, the Consultant and/or the Owner will inspect the Work. Manufacturers and or Suppliers may participate in the inspection as required by their contract obligations. Upon Acceptance, the Contractor will provide a workmanship warranty in accordance with the Contract Documents.

1.11 EXISTING SERVICES

.1 Notify the Owner, the Consultant, Third Party Property Owners when applicable, and utility companies of intended interruption of existing services and obtain required permissions when applicable.

.2 Where Work involves breaking into or connecting to existing services, provide the Owner at least five (5) Working Days' notice of necessary interruptions of mechanical or electrical service during the Work. Minimize the duration of interruptions. Carry out Work at times as directed by Authorities Having Jurisdiction and the Owner to ensure minimum disturbance to pedestrian and vehicular traffic and the Owner operations.

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

.4 Establish location and extent of service lines in the Place of the Work before starting Work. Notify the Consultant of findings.

.5 Submit schedule for Acceptance by the Consultant ten (10) Working Days before any scheduled work for any shut-down or closure of active service or facility including power and communications services. Adhere to Accepted schedule and provide notice to affected parties. Refer to Section 01 14 00 - Work Restrictions.

.6 Provide temporary services when directed by the Owner to maintain critical operations, building and tenant services. Refer to Section 01 14 00 - Work Restrictions.

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

.8 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in a manner approved by Authorities Having Jurisdiction and the Consultant.

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

.10 Construct barriers, as required, in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.11 Locate and trace existing underground services before any excavation.

.12 Any damage to existing services during the Work will be the responsibility of the Contractor.

1.12 DOCUMENTS REQUIRED

.1 Maintain at the Place of the Work, one copy of each document as follows:

.1 Contract Documents.

.2 Contract Drawings.

.3 Technical Specifications.

.4 Accepted Shop Drawings, Product data and samples.

.5 List of Outstanding Shop Drawings.

.6 Change Orders.

.7 Other Contract Amendments.

.8 Field Test Reports.

.9 Copy of Accepted Construction Schedule.

.10 Health and Safety Plan and Other safety related documents.

.11 As-Built Drawings.

.12 Other documents as specified.

2 EXECUTION

2.01 General Requirements:

.1 Contractor will be required to complete the Work in accordance with applicable federal, provincial, and municipal laws.

.2 The Contractor shall designate a Project Manager with overall responsibility for the Work. The Contractor will also designate a site supervisor who will be responsible for managing the Work at each site and be responsible for on-site safety, including all Sub-contractors and Suppliers. The site supervisor will be the single point of contact at each site. This site supervisor will be required to communicate with the Consultant and Owner as required to ensure the Work is completed safely

with no impact on Owner operations.

.3 The Contractor will be required to coordinate their hours of work with the Owner.

.4 The Contractor's employees, Subcontractors, and Suppliers will be required to sign in and sign out every time they enter or leave the Place of the Work using a sign-in/sign-out log book which will be held by the site supervisor in charge of that site.

.5 Contractor shall supply all necessary tools, machinery, and equipment to perform the Work including, but not limited to, forklifts, mobile cranes, hoisting equipment, scaffolding, ladders, man lifts, temporary lighting, heating, welding machines, ventilation, consumables, and any other material or equipment required to complete the Work. The Contractor shall provide all necessary vehicles and qualified personnel to transport people and materials.

1 GENERAL

1.01 REFERENCE STANDARDS

1. Canadian Construction Documents Committee (CCDC)

   .1 CCDC 2-2020, Stipulated Price Contract.

1.02 RELATED REQUIREMENTS

.1 Canadian Rail Operating Rules.

.2 ONTC Contractor/Subcontractor Policy.

.3 Contractors Working On ONTC Property Near Railway Tracks.

.4 Railway Flagging Protection Policy

.5 Section 01 73 00 - Execution

1.03 ACCESS AND EGRESS

.1 Design, construct and maintain temporary “access to” and “egress from” Construction Areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with the applicable laws of Authorities Having Jurisdiction.

1.04 USE OF SITE AND FACILITIES

.1 Execute Work with least possible interference or disturbance to normal use of premises. Make arrangements with Consultant to facilitate Work as stated.

.2 Where premises are not owned by the Owner or are leased to Third Party Property Owners, provide written notification of access and planned Work to the Consultant (10) Working Days prior to the Work commencing.

.3 Maintain existing services to building and provide for safe and protected access for people and vehicles.

.4 Where security is reduced by the Work provide temporary means to maintain security.

.5 Closures: protect the Place of the Work temporarily until permanent enclosures are completed.

.6 Carry out Work Monday to Friday during hours of 7:00 am to 5:00 pm. Work outside of these hours, including on weekends, shall be pre-approved. Submit a request to the Owner for review and approval to work outside these hours a minimum of five (5) Working Days prior to the work commencing.

1.05 SPECIAL REQUIREMENTS

.1 Protect rail infrastructure as directed by the Owner and obtain approval before working near live tracks. Submit a request to the Consultant in accordance with the Contractors Working On ONTC Property Near Railway Tracks and Railway Flagging Policies for any scheduled work near rail tracks. Requests should be submitted seven (7) Working Days prior to the Work commencing. Include in the request the scope of Work, proposed schedule (duration) and names of workers who will perform the Work. Follow the ONTC policies while working near tracks. Work near tracks will be supervised by the Owner. The Owner will provide a qualified person for flagging protection. Upon completion of the Work, clean the area and return the area and affected adjacent areas to their original or better conditions. Adhere to direction of the person providing flagging protection to ensure the site is safe and ready to resume rail operations.

.2 Ensure Contractor's personnel on site are familiar with and obey the policies and safety, fire, traffic and security regulations and have completed the ONTC site orientation training.

.3 Keep within limits of Work and avenues of ingress and egress.

.4 **Additional requirements**:

.2 Construct Work in stages and in a manner that accommodates the Owner's continued and/or intermittent use of premises during construction.

.3 ONTC operations shall not be interrupted. Coordinate with Consultant to facilitate the execution of the work with minimal disruption.

.4 Arrange and obtain Consultant approval for any temporary utility outages a minimum of seven (7) Working Days prior to the commencement date of the Work, including details about the Work to be completed and the schedule for the Work. Provide temporary power services to ensure no outages to maintain critical operations, building and tenant services.

.5 Limit access to the Construction Area.

.6 Employ just-in-time delivery methods to minimize required storage and laydown space.

.7 Arrange and obtain Owner approval to access ONTC building to complete Work under this Contract. Submit a request to Owner and the Consultant a minimum of seven (7) Working Days prior to the proposed commencement date for the Work, including details about the Work to be completed, the schedule for the Work and a list of Contractor employees and Subcontractors and Suppliers involved in the Work.

.8 Park vehicles in locations approved by Consultant.

.9 Park vehicles in locations approved by the Consultant and Third-Party Property Owner.

.10 Inform Owner and the Consultant of large deliveries and arrange the delivery in a manner that will not affect ONTC operations or the safety of public.

.11 Obey site traffic rules and speed limits.

1.06 SMOKING ENVIRONMENT

.1 Comply with smoking and vaping restrictions. Smoking and vaping are not permitted.

1.07 VIDEO SURVEILLANCE:

.1 Video surveillance cameras are installed on Ontario Northland-owned and leased property to ensure the safety and security of passengers, employees, visitors, assets, infrastructure and the public. In accordance with the Freedom of Information and Protection of Privacy Act (FIPPA), the use of video surveillance cameras is carried out in a manner that respects and minimizes privacy intrusion. Recorded video footage only is protected, used or disclosed for investigative purposes related to a health and safety matter, a railway occurrence or for an incident of suspected crime, property damage, motor vehicle damage or personal injury.

1.08 COMMUNICATION PROHIBITION:

.1 Owner will lead and make any announcements relating to the Work. The Contractor shall not make any announcement of any kind, including press releases, social media posts, public declarations, or any form of publication or announcement, in relation to the Work unless prior written consent is given by Owner. If the Contractor is contacted by any media outlet or other person or entity wishing to make any form of publication or announcement or seeking any information in relation to the Work, the Contractor shall not provide any information and shall refer the person to Owner and immediately notify Owner.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

1.03 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the Work in accordance with the Specifications and at the call of the Owner or the Consultant.

.2 Prepare agenda for meetings.

.3 Unless otherwise specified in Specification sections, distribute written notice of each meeting five (05) Working Days in advance of meeting date to the Owner, the Consultant and any other meeting participants.

.4 Provide physical space at one of the Places of Work and make arrangements for meetings.

.5 The Consultant will chair the meetings.

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

.7 Reproduce and distribute copies of minutes within three (03) Working Days after meetings and transmit to meeting participants and, affected parties not in attendance, the Owner and the Consultant.

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

1.04 PRECONSTRUCTION MEETING

.1 Within (10) Working Days after award of Contract and before Contractor mobilization to the Place of the Work, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities related to the Work.

.2 The Owner, Consultant, Contractor, major Subcontractors, field inspectors and supervisors and other parties, as applicable and at their discretion, will be in attendance.

.3 Arrange with the Consultant the time and location of meeting and notify parties concerned minimum five (5) Working Days before meeting.

.4 Agenda to include, but not limited to:

.1 Appointment of official representative of participants in the Work.

.2 Construction Schedule: in accordance with Section 01 32 00 – Construction Progress Documentation.

.3 Schedule of submission of Shop Drawings, samples, colour chips. Submit Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.4 Requirements for temporary facilities, site signage, offices, storage sheds, utilities, site set-up/Utility connections, laydown areas, fences in accordance with Section 01 52 00 - Construction Facilities.

.5 Delivery schedule of specified equipment in accordance with Specifications.

.6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.7 Proposed changes, Change Orders, procedures, Acceptance required, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements.

.8 Products Supplied by Others

.9 Record As-Built Drawings in accordance with Section 01 33 00 - Submittal Procedures.

.10 Operations and Maintenance manuals in accordance with Section 1 78 00 - Closeout Submittals.

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

.12 Monthly progress, claims, administrative procedures, photographs, holdbacks, commissioning, and training.

.13 Appointment of inspection and testing agencies or firms.

.14 Insurances, transcript of policies.

.15 Site Safety and Fire protection in accordance with section 01 35 29.06 Health And Safety Requirements.

.16 Existing conditions and ONTC site use/operations.

.17 Cleaning and Waste Management

.18 Invoicing and payment procedures

.19 Lines of Communication, use of Social Media and distribution List.

1.05 PROGRESS MEETINGS

.1 During course of Work and up to the completion date, schedule regular monthly progress meetings.

.2 Contractor, major Subcontractors involved in Work, the Owner, and the Consultant are to be in attendance. Other parties may attend subject to the agreement of the Consultant.

.3 Agenda to include, but not limited to, the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede Construction Schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain baselined Construction Schedule.

.7 Proposed revisions to Construction Schedule.

.8 Progress against Construction Schedule, during succeeding work period.

.9 Review Submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for effect on Construction Schedule and on completion date.

.12 Safety concerns and issues.

.13 Open items, Request For Information (RFI) and Supplemental Instructions (SI).

.14 Other business.

1.06 COMMISSIONING MEETINGS

.1 Arrange pre-commissioning meetings for the commissioning of equipment and systems in accordance with 01 91 13 – General Commissioning Requirements. The Owner, the Consultant and Contractor commissioning team shall be in attendance.

.2 The meeting's intent is to ensure all parties are fully aware of the Commissioning expectations and requirements.

.3 Meeting Agenda to include, but not limited to:

.1 Review Commissioning plan, Specification, and process.

.2 Review Commissioning documentation.

.3 Review all factory testing that will be required.

.4 Review training requirement/schedule.

.5 Discuss future Commissioning meetings.

.6 Issues/risks.

1.07 SUBSTANTIAL COMPLETION MEETINGS:

.1 Arrange pre-Substantial Completion meetings. The Contractor, the Owner and the Consultant shall be in attendance.

1.08 OTHER MEETINGS:

.1 The Contractor shall, as directed by the Consultant, attend Project coordination meetings, which may be required in addition to the specific meetings listed herein. Meetings may include topics related to site and railway safety, orientation and training, design compliance, Work progress and issues, installation of Products Supplied by Others, coordination of Subcontractors, quality, delivery and Acceptance activities, warranty, dispute resolution, and environmental issues.

.2 Arrange meetings with the Consultant to coordinate large deliveries and in advance of complex installation.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 This Section specifies Contractor's responsibilities for the preparation and submission of Construction Schedule updates, progress reports and other documentation related to tracking progress of the Work.

.2 The purpose of submitting construction progress documentation is to:

.1 Inform the Owner and the Consultant of actual progress versus planned progress, and;

.2 Provide assurance that scheduling issues are being proactively identified and addressed in a timely manner, and that planned progress is being maintained as closely as possible.

1.02 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.03 RELATED SECTIONS

.1 Section 01 31 19 - Project Meetings.

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 01 77 00 - Closeout Procedures.

1.04 SUBMISSION

.1 Submit, for review and Acceptance a Construction Schedule within ten (10) Working Days from Contract award. The Construction Schedule shall be based on the Contractor's initial schedule submitted at the RFP phase. Notify the Consultant of any major changes from the initial schedule.

.2 Submit schedules in PDF and Excel files. Submit via email unless otherwise requested.

.3 Consultant will review the Construction Schedule and return review copy within ten (10) Working Days after receipt.

.4 If changes are required, resubmit, the Construction Schedule for Acceptance within five (5) Working Days after return of review copy.

.5 The Accepted Construction Schedule shall be baselined and all progress updates shall be made against this version. The baselined Accepted Construction Schedule shall not be changed without the agreement of the Consultant and shall be subject to review and Acceptance prior to becoming the new baselined Construction Schedule.

.6 Submit updated progress schedule with each monthly construction report in accordance with clause 2.2 of this section.

.7 Distribute copies of revised schedule to:

.1 Job site offices.

.2 Subcontractors.

.3 Other concerned parties.

.8 Instruct recipients to report to Contractor within five (5) Working Days any problems anticipated by timetable shown in the schedule.

1.05 CONSTRUCTION SCHEDULE UPDATES

.1 Show projected percentage of completion of each item as of the last date of the month.

.2 Indicate progress of each activity to date of submission schedule.

.3 Show changes occurring since previous submission of Construction Schedule:

.1 Major changes in scope.

.2 Activities modified since previous submission.

.3 Revised projections of progress and completion.

.4 Other identifiable changes.

.4 Provide a narrative report to define:

.1 Problem areas, anticipated delays, and impact on schedule.

.2 Corrective action recommended and its effect.

.3 Effect of changes on schedules of other prime contractors.

.5 Schedules shall be continuous, and logic driven without using hard constraints, Lags and Leads.

2 PRODUCTS:

2.01 DAILY CONSTRUCTION REPORTS:

.1 Prepare a daily construction report recording the following information concerning events at Project Site and include progress photos as applicable:

.1 List of subcontractors at Project Site.

.2 Approximate count of personnel at Project Site.

.3 Equipment at Project Site.

.4 Material Deliveries.

.5 Accidents/Incidents/Near Misses.

.6 Meetings and Significant Decisions.

.7 Unusual and emergency Events.

.8 Stoppages, Delays, Shortages, and Losses.

.9 Orders and requests of Authorities Having Jurisdiction.

.10 Change Orders received and implemented.

.11 Construction Work Change Directives received and implemented.

.12 Services Connected and Disconnected.

.13 Equipment or System Tests and Startups.

.14 Partial Completions and Occupancies.

.15 Substantial Completions Authorized.

.16 Progress made in Work that day

.2 Submit daily reports at the end of each shift to ONTC and the Consultant.

.3 A report shall be submitted for each Work site.

2.02 RECORDING ACTUAL SITE CONDITIONS ON AS-BUILT DRAWINGS

.1 Obtain from Consultant an electronic copy of the construction Drawings for the purpose of creating As-built drawings.

.2 Record information on a set of black line opaque drawings.

.3 Use marking pens, maintaining separate colours for each major system, for recording information.

.4 Clearly label each As-Built Drawing as “AS-BUILT DRAWING”. Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.5 Record actual construction including:

.1 Measured depths of elements of foundation in relation to finish first floor datum;

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements;

.3 Measured locations of pipes, ducts, conduits, outlets, fixtures, access panels, and appurtenances, referenced to visible and accessible features of construction;

.4 Field changes of dimension and detail;

.5 Changes made by Change Orders and Supplemental Instructions;

.6 References to Shop Drawings, where Shop Drawings show more detail.

.7 Referenced Standards to related Shop Drawings and modifications.

.8 Details not on original Contract drawings.

.6 Do not use As-Built Drawings for construction purposes.

.7 Following construction, Contractor shall prepare As-Built Record Drawings in accordance with Section 01 78 00 Closeout Submittals.

2.03 MATERIAL LOCATION REPORTS:

.1 At bi-weekly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Place of the Work. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

.2 Indicate the following categories for stored materials:

.1 Material stored prior to previous report and remaining in storage.

.2 Material stored prior to previous report and since removed from storage and installed.

.3 Material stored following previous report and remaining in storage.

3 EXECUTION

3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

.1 Contractor's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities.

.2 Distribution: Distribute copies of Accepted Construction Schedule to the Owner, Consultant, Subcontractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

.1 Post copies in Project meeting rooms and temporary field offices.

.2 When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 MEASUREMENT AND PAYMENT

.2 Separate measurement or payment will not be made for Work required under this section. All costs in connection with the Work specified herein will be considered to be included with the related item of Work or incidental to the Work.

1.03 FREQUENCY OF PHOTOGRAPHIC DOCUMENTATION

.1 The Contractor shall take photographs as indicated in Specification sections, at all construction milestones as identified in the Accepted Construction Schedule, and at each of the following stages of construction:

.1 Before commencement of clearing and demolition;
.2 Upon completion of clearing and demolition;
.3 Upon completion of excavation
.4 Upon completion of foundation and concrete work.
.5 Delivery and installation of Structural steel.
.6 Building Envelope Construction (roof, walls, doors, windows, etc.)
.7 Upon completion of any remedial Work.
.8 Upon completion of the Work.
.9 Anytime a problem arises that may result in a potential claim and the problem can be illustrated by photographs.

.2 Furnish at least three different views or vantage points of each milestone and stage of construction. Furnish an average of 20 photographs each month until completion of the Work. Location of views shall be as agreed with the Consultant.
.3 Contractor shall take photos at each shift and include photos in the daily report in accordance with section 01 32 00-Construction Progress Documentation.
.4 Submit photos to the Consultant with the monthly progress reports in accordance with section 01 32 00-Construction Progress Documentation and other reports in accordance with Specification sections and Contract Documents.
.5 Transfer photos to the Owner at the end of the Project.

1.04 QUALITY AND QUANTITY OF PHOTOGRAPHS

.1 All photographs shall be digital photographs in pdf, jpg or png format with the following requirements:

.1 Minimum resolution: 1024 x 768 pixels.

.2 Colors: 24 Bits per Pixel.
.3 Maximum File size of 3MB.

.2 Digital photographs provided shall use the following file naming convention:

PYYMMDDLOCATIONSEQ.EXT

P =	Photograph
YYMMDD =	Date in Year, Month, Day format
LOCATION =	(8 Characters maximum) Location taken, either by BART 3-character alpha numeric + 5, or Milepost by line designation. (e.g. M90, C40-west, A1MP32-1, etc.)
SEQ =	Sequential number from 001 to 999.
EXT =	File extension (e.g. pdf, jpg, or png).

.3 If flash drives are used to store photos they shall be labeled to include the Contract number and the date the photographs were taken.

1.05 IDENTIFICATION OF PHOTOGRAPHS

.1 The following information shall be furnished for each digital photograph in a manner approved by the Owner.

.1 Title of Contract and Contract Number;
.2 Site location.
.3 Identification of subject shown;
.4 Station point of camera and direction of view;
.5 Time and date taken.

1.06 VIDEO RECORDINGS

.1 The Contractor shall provide video recordings to supplement Contract photographs of certain construction milestones as identified in the Accepted Construction Schedule, and events as indicated herein:

.1 Start of construction, including clearing and demolition operations, as applicable;
.2 Highlights of all formal inspections; and
.3 Highlights of the final inspection and acceptance by the Owner and Consultant and Authority having jurisdiction.
.4 Video recordings shall be at minimum standard definition (480p).

.2 Video recordings shall include an unobtrusive time and date indicator on the film, accurately depicting the time and date when the photography was performed.
.3 If flash drives are used to store videos they shall be labeled to include the Contract number and the date the video was taken.
.4 Individual digital video files shall use the file naming convention indicated above, paragraph 1.03.2, however the filename shall be modified such that the first character shall be “V” for video instead of “P”.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 RELATED REQUIREMENTS

.1 Section 01 32 33 – Photographic Documentation

.2 Section 01 43 00 - Quality Assurance.

1.03 ADMINISTRATIVE REQUIREMENTS

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

.2 Do not proceed with Work affected by Submittal until review is complete and Acceptance has been provided.

.3 Present Shop Drawings, Product data, samples and mock-ups in SI Metric units.

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

.5 Review Submittals before submission to the Consultant. Stamp Submittals as “Approved by Contractor” prior to submitting to the Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each Submittal has been checked and coordinated with requirements of Work and Contract Documents and Contractors own quality procedures. Submittals not stamped, signed, dated and identified as to specific Project will be returned without being examined and considered rejected.

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

.7 Verify site measurements and affected adjacent Work are coordinated.

.8 Keep one Accepted copy of each Submittal on site.

1.04 SHOP DRAWINGS, PRODUCT DATA AND OTHER SUBMITTALS

.1 Refer to CCDC 2 GC 3.8 Shop Drawings and Supplementary General Conditions.

.2 Refer to Specifications for all other required Submittals.

.3 Submit for review and Acceptance Shop Drawings stamped and signed by professional engineer licensed in Province of Ontario, Canada.

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

installed. Indicate cross references to Contract Drawings and Specifications.

.5 Allow ten (10) Working Days for Consultant review of each Submittal, unless otherwise specified.

.6 Adjustments requested on Shop Drawings by the Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to the Consultant and do not proceed with Work. Such adjustment shall be approved by a Change Directive or Change Order issued by the Owner in accordance with the Contract Documents.

.7 Make changes in Shop Drawings as the Consultant may require, consistent with Contract Documents. When resubmitting, notify the Consultant in writing of revisions other than those requested.

.8 Accompany Submittals with transmittal letter containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each Shop Drawing, Product data, and sample.

.5 Other pertinent data.

.9 Submittals to include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

.4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of site measurements and compliance with Contract Documents.

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified site dimensions and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Material being supplied, all connections, attachments, anchorages and locations of exposed fastenings as applicable.

.11 Typical and special installation conditions, including setting or erection details.

.12 Relationship to adjacent work.

.13 Copy of associated Project warranty.

.10 After the Consultant review and Acceptance, distribute copies.

.11 Submit electronic copy of Shop Drawings for requirements requested in Specifications and as the Consultant may reasonably request. Submit electronic copies of Product data sheets or brochures for requirements requested in Specifications and as requested by the Consultant where Shop Drawings will not be prepared due to standardized manufacture of Product.

.1 Product data: manufacturers' catalogue sheets, MSDS sheets, brochures, literature, performance charts and diagrams used to illustrate standard manufactured products or any other specified information.

.2 Delete information not applicable to Project.

.3 Supplement standard information to provide details applicable to Project.

.4 Cross-reference Product data information to applicable portions of Contract Documents.

.12 Submit electronic copies of test reports for requirements requested in Specifications and as requested by the Consultant.

.1 Report signed by authorized official of testing laboratory that material, Product or system identical to material, Product or system to be provided has been tested in accord with specified requirements.

.13 Submit electronic copies of certificates for requirements requested in Specifications and as requested by the Consultant.

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

.2 Certificates must be dated after the award of the Contract, complete with the Project name.

.14 Submit electronic copies of manufacturers' instructions for requirements requested in Specifications and as requested by the Consultant.

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

.15 Submit electronic copies of manufacturer's site reports for requirements requested in Specifications and as requested by the Consultant.

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

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

.17 Submit electronic copies of Operation and Maintenance Data for requirements requested in Specifications and as requested by Owner, after a review of an electronic copy has been completed and Accepted by the Consultant.

.1 Submit four (04) hard copies, unless otherwise specified, of reviewed and Accepted Operation and Maintenance Data.

.18 Delete information not applicable to Project.

.19 Supplement standard information to provide details applicable to Project.

.20 If upon review by the Consultant, no major corrections are requested, electronic copies will be returned as Accepted or Accepted with comments (in the case of minor corrections) and fabrication and installation of Work may proceed. Requested minor corrections shall be made in a timely manner. If Shop Drawings are rejected, noted copy will be returned and resubmission of corrected Shop Drawings for review and Acceptance, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.21 Acceptance of the Shop Drawings does not mean confirmation that the Submittal does not include errors or omissions, defects or deficiencies.

1.05 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic colour digital photography in accordance with section 01 32 33 – Photographic Documentation, Contract Documents, and as directed by the Consultant.

.2 Provide photographs in the requested format to demonstrate progress and how deficient items identified within the Consultant review and inspection reports have been corrected.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

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

.1 R.S.C., 1985, c. L-2

.2 Province of Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990, c.0.1, as amended and O. Reg. 213/91 as amended] - Updated August 8, 2023.

.3 National Building Code of Canada (NBC):

.1 Part 8, Safety Measures at Construction and Demolition Sites.

.4 The Canadian Electric Code (as amended)

.5 Canadian Standards Association (CSA) as amended:

.1 CSA Z797-2009 Code of Practice for Access Scaffold.

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

.3 CSA Z462- Workplace Electrical Safety Standard.

.6 National Fire Code of Canada 2015 (as amended)

.1 Part 5 – Hazardous Processes and Operations and Division B as applicable and required.

.7 American National Standards Institute (ANSI):

.1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.

.8 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 RELATED REQUIREMENTS

.1 Section 01 31 19 – Project Meetings

.2 Section 01 33 00 - Submittal Procedures

.3 Section 01 35 43 – Fire Safety Requirements

.4 Section 01 35 43 - Environmental Procedures

.5 Section 01 51 00 - Temporary Utilities

.6 Section 01 56 00 - Temporary Barriers and Enclosures

.7 ONTC Contractor Subcontractor Policy.

.8 ONTC Electrical Safety Policy.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit for Acceptance Project-specific Health and Safety Plan within seven (7) Working Days after Contract award and fifteen (15) Working Days prior to commencement of Work on site. Health and Safety Plan must include:

.1 Results of site-specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Emergency Procedures.

.3 The Consultant's review and Acceptance of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.4 Submit electronic copies of Contractor's authorized representative's work site health and safety inspection reports to the Owner and the Consultant, and Authority Having Jurisdiction (AHJ) when required.

.5 Submit to the Owner and the Consultant copies of reports or directions issued by health and safety inspectors of the Authority Having Jurisdiction (AHJ).

.6 Submit to the Owner and the Consultant electronic copies of incident and accident reports.

.7 Submit to the Consultant WHMIS Safety Data Sheets (SDS) and all other documentation required by Workplace Hazardous Materials Information System (WHMIS) requirements. Include and an update the Health and Safety Plan as required.

.8 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit to the Consultant certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel.

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

1.04 FILING OF NOTICE

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

.2 Provide copies of all notices to the Consultant.

.3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of Project.

1.05 SAFETY ASSESSMENT

.1 Conduct a site-specific hazard assessment based on review of Contract Documents, required Work, and Project site. Identify any known and potential health risks and safety hazards.

.2 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications and , include, but not be limited to, the following:

.1 Primary requirements:

.1 Contractor's and ONTC safety policy.

.2 Identification of applicable compliance obligations.

.3 Definition of responsibilities for Project safety; include an organization chart for Project with safety responsibilities clearly indicated.

.4 General safety rules for Project.

.5 Job-specific safe work procedures.

.6 Inspection policy and procedures.

.7 Incident reporting and investigation policy and procedures.

.8 Occupational Health and Safety Committee/Representative procedures.

.9 Occupational Health and Safety meetings.

.10 Occupational Health and Safety communications and record keeping procedures.

.2 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the Work.

.3 List hazardous materials to be brought on site as required by Work.

.4 Indicate engineering and administrative control measures to be implemented at the Place of Work for managing identified risks and hazards.

.5 Identify personal protective equipment (PPE) to be used by workers.

.6 Identify personnel and alternates responsible for site safety and health.

.7 Identify personnel training requirements and training plan, including site orientation for new workers.

.3 Develop the plan in collaboration with all Subcontractors. Ensure that work/activities of Subcontractors are included in the hazard assessment and are reflected in the plan.

.4 Revise and update Health and Safety Plan as required, and re-submit for Acceptance in accordance with 01 33 00 – Submittal Procedures

.5 Review and Acceptance: the review and Acceptance of site-specific Health and Safety Plan shall not relieve the Contractor of responsibility for errors or omissions in final site-specific Health and Safety Plan or of responsibility for meeting all requirements of construction and Contract Documents.

1.06 MEETINGS

.1 Schedule and administer Health and Safety meeting with the Owner and the Consultant prior to commencement of Work. This meeting shall be included in the Pre-construction Meeting.

.2 Attend all subsequent Health and Safety meetings called by the Owner or the Consultant.

1.07 REGULATORY REQUIREMENTS

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

1.08 PROJECT/SITE CONDITIONS

.1 Work at site may involve contact with:

.1 Public.

.2 ONTC employees.

.3 Other contractors and consultants.

.4 Third Party Property Owner.

.2 The Contractor is solely responsible for all utility detection and clearances prior to starting the Work.

.3 The Contractor will not rely solely upon the Drawings or other information provided for utility locations.

.4 Carry out any activities involving asbestos in accordance with applicable Provincial / Federal Regulations.

.5 Removal and handling of asbestos will be in accordance with applicable Provincial / Federal Regulations.

.6 Refer to reports in Attachment 1 to the Specifications for further site conditions and assessment reports for any noted hazardous or contaminated materials or substances present at Place of the Work. Contractor should their own assessments prior to commencing Work.

1.09 GENERAL REQUIREMENTS

.1 In accordance with 01 56 00 – Temporary Barriers and Enclosures, provide safety barricades and

lights around work site as required to provide a safe working environment for workers and protection for pedestrian and vehicular traffic.

.2 Ensure that non-authorized persons are not allowed to circulate in designated construction areas of the work site.

.1 Provide appropriate means by use of barricades, fences, warning signs, traffic control personnel, and temporary lighting as required.

1.10 RESPONSIBILITY

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

.2 Contractor will be responsible and **assume the role of Constructor** as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

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

.4 Provide first aid, hygiene, and medical facilities at the Place of the Work in accordance with requirements of provincial and local governmental occupational health, safety, and workers' compensation statutes, public health guidance publications (where warranted) and Contract Documents.

1.11 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.

.2 Comply with all Federal and Provincial laws relating to Health and Safety including Acts and Regulations as well as Lower Tier Municipality By-Laws.

.3 Comply with all applicable industry safety standards.

.4 Comply with legislative requirements for work performed including, but not limited to:

.1 Qualifications of workers;

.2 Training;

.3 Supervision, and;

.4 Use of onsite equipment.

.5 Provide any and all personal protective equipment for Contractor's own workers where prescribed by legislation.

1.12 UNFORSEEN HAZARDS

.1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise Contractor's nominated Health and Safety Coordinator and follow procedures in accordance with Acts and Regulations of Province having jurisdiction and advise the Consultant verbally and in writing.

1.13 CONTRACTOR HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:

.1 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel that do not successfully complete required training are not permitted to enter site to perform Work.

.2 Maintain a training record/log of Contractor employee including all Subcontractors, suppliers and other parties retained by the Contractor for the execution of the Work, at the jobsite and electronic copy, available for the Owner and the Consultant review at request.

.3 Be responsible for implementing, revising, enforcing daily and monitoring site-specific Contractor's site-specific Health and Safety Plan.

.4 Visit each Place of the Work regularly, at least biweekly or as required by health and safety laws and regulations, to ensure Work is being completed in compliance with Contractor's Health and Safety programs and all applicable laws and regulations.

.2 Contractor's nominated site supervisor may complete some of daily tasks of the Health and Safety Coordinator provided the site supervisor has the proper qualifications to complete those tasks.

1.14 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Ontario having jurisdiction, and in consultation with the Consultant.

.2 Post legible versions of the following documents on site:

.1 Site Specific Health and Safety Plan.

.2 Sequence of work.

.3 Emergency procedures.

.4 Site drawing showing Project layout, locations of the first-aid station, marshalling stations, and emergency transportation provisions.

.5 Notice of Project.

.6 Site plans.

.7 Notice as to where a copy of the Workers' Compensation Act and Regulations is available

on the work site for review by employees and workers.

.8 Workplace Hazardous Materials Information System (WHMIS) documents.

.9 WHIMS Safety Data Sheets (SDS).

.10 List of names of Joint Health and Safety Committee members, or Health and Safety Representative, as applicable.

.11 Others as required.

1.15 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by Authority Having Jurisdiction (AHJ), the Consultant or by Owner.

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

.3 The Owner or the Consultant may stop Work if non-compliance of health and safety regulations is not corrected. The Contractor/Subcontractors will be responsible for any costs arising from such a “stop work order”.

1.16 ELECTRICAL SAFETY REQUIREMENTS

.1 Comply with authorities and ensure that, when installing new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.

.2 Before undertaking any Work, coordinate required energizing and de-energizing of new and existing circuits with the Owner.

.3 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

1.17 ELECTRICAL LOCKOUT

.1 Develop, implement and enforce use of established procedures to provide electrical lockout and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.

.2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/authorization form. Have procedures available for review upon request by the Owner or the Consultant.

.3 Keep the documents and lockout tags at the site and list in a logbook for the full duration of the Contract. Upon request, make such data available for viewing by the Owner, the Consultant or by any authorized safety representative.

1.18 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment

over cost and schedule considerations for Work.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.189-[00], Exterior Alkyd Primer for Wood.

.2 CGSB 1.59-[97], Alkyd Exterior Gloss Enamel.

.3 CSA Group (CSA)

.1 CSA-A23.1/A23.2-[04], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-0121-[M1978(R2003)], Douglas Fir Plywood.

.3 CAN/CSA-S269.2-[M1987(R2003)], Access Scaffolding for Construction Purposes.

.4 CAN/CSA-Z321-[96(R2001)], Signs and Symbols for the Occupational Environment.

.4 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

1.03 INSTALLATION AND REMOVAL

.1 For each Place of the Work prepare site plan indicating proposed location and dimensions of the Construction Area to be fenced and used by Contractor, number of trailers if required, area for parking vehicles, avenues of ingress/egress to fenced area and details of fence installation. Construction Area shall be within the area indicated in the Contract Drawings. Submit site plan to Consultant for review and Acceptance.

.2 Indicate use of supplemental or other staging areas.

.3 Provide construction facilities in order to execute Work expeditiously.

.4 After use remove from site all such work installed under this section 01 52 00 – Construction Facilities. Reinstate area to same or better state before start of Project.

1.04 SCAFFOLDING

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

.2 Provide and maintain scaffolding, ramps, ladders, platforms, temporary stairs.

1.05 HOISTING

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

.2 Hoists and cranes to be operated by qualified operator.

1.06 ELEVATORS

.1 When applicable, permanent elevators are not to be used by Contractor, Subcontractor or supplier personnel or for transporting of materials unless approved by the Owner. Co-ordinate use with the Owner if use is permitted.

.2 If use of elevators is approved by the Owner, provide protective coverings for finish surfaces of walls, floors and entrances.

1.07 SITE STORAGE/LOADING

.1 Confine Work and operations of employees to the Construction Area. Do not unreasonably encumber premises with Products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work. Be solely responsible and liable for damages resulting from violation of this requirement.

.3 Products shall be stored only in areas designated or approved by the Consultant and shall not be left on the ground or in undesignated areas.

.4 Site storage and loading requirements to be in accordance with Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

1.08 CONSTRUCTION PARKING

.1 Parking may be permitted on site provided it does not disrupt performance of Work. Arrange with the Consultant and obtain approval before site usage. Show location of agreed parking on site plan.

.2 Parking within the Construction Area shall be managed by the Contractor as long as it does not affect work performance or Safety.

.3 Provide and maintain adequate access to Project sites.

.4 Parking arrangements shall be in accordance with location specific restrictions contained in section 011400 – Work Restrictions.

1.09 TEMPORARY SECURITY

.1 Contractor is responsible for the security of the Place of the Work and any off-site other locations used by the Contractor for the execution of the Contract such as off-site temporary storage spaces.

.1 Temporary Site Security:

1. Site Fencing: Before beginning excavation and before construction activities begin, provide temporary site enclosure fencing with lockable gates to prevent unauthorized access.
2. Extent of Fencing: To enclose entire Project site or a portion sufficient to accommodate construction activities as indicated on Drawings.

3. Distribute gate keys to authorized personnel only. Supply Consultant and Owner with one set of keys each.

.2 Temporary Building Security:

1. Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized access, vandalism, theft, and similar security violations.
2. Distribute building entrance keys to authorized personnel only. Supply Owner and Consultant with one set of keys each.

1.10 OFFICES

.1 Provide one field office for the duration of the Work. The field office can be located within the Contractor Construction trailer and shall have proper heating, lighting, and ventilation and be of sufficient size to accommodate site meetings.

.2 Provide one workspace in field office for use by the Owner and the Consultant.

.3 Provide marked and fully stocked first-aid case in a readily available location.

.4 Subcontractors to provide their own offices as necessary. Arrange with the Consultant location of these offices.

.5 Maintain offices in a clean condition.

1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof storage space (sea-cans, sheds, etc.) for storage of tools, equipment and materials.

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

.3 Ensure all equipment, tools and materials (including salvaged material) are stored clear of the rail Right of Way in a position where it they will not interfere with train operations and employee movements. Ensure all equipment, tools and materials and are secured in such a manner that they cannot fall or be placed foul of the rail line.

1.12 SANITARY FACILITIES

.1 Provide sanitary facilities for workforce in accordance with governing regulations and ordinances and in accordance with 01 51 00 – Temporary Facilities.

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

1.13 CONSTRUCTION SIGNAGE

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

.2 Signs and notices for safety and instruction in English Graphic symbols to CAN/CSAZ321.

.3 Maintain approved signs and notices in good condition for duration of Project and dispose of offsite on completion of Project or earlier if directed by the Consultant.

.4 Provide signage in compliance O. Reg. 213/91 CONSTRUCTION PROJECTS, Canada Occupational Health and Safety Regulations SOR/86-304, Ontario Occupational Health and Safety Act, R.S.O. 1990 and applicable laws and standards.

.5 The Owner may supply or instruct the Contractor to supply other signs. Signs shall be installed by the Contractor. Specification of signage will be provided by the Owner. Any additional cost will be valued as per Contract Documents.

1.14 PROTECTION AND MAINTENANCE OF TRAFFIC

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

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by the Consultant.

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

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

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

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

.7 Construct access and haul roads necessary only after obtaining the Consultant’s approval.

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

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

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

.11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by the Owner.

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

.13 Provide snow removal during period of Work.

.14 Remove, upon completion of Work, access roads designated by the Owner.

1.15 CLEAN-UP

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

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities at a location approved by the Consultant.

2.01 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of Authorities Having Jurisdiction, sediment and erosion control drawings, sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of Authorities Having Jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-[97], Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-[00], Exterior Alkyd Primer for Wood.

.3 CSA Group (CSA)

.1 CSA-O121-[M1978(R2003)], Douglas Fir Plywood.

1.02 RELATED REQUIREMENTS

.1 Section 01 14 00 – Work Restrictions

.2 Section 01 52 00 – Construction Facilities

.3 Section 01 55 26 – Traffic Controls

.4 Section 01 57 00 – Temporary Controls.

.5 Section 01 74 00 – Cleaning

.6 Section 01 74 19 – Waste Management and Disposal.

1.03 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.04 HOARDING

.1 Unless otherwise specified, erect temporary site enclosures using self-supporting 1.8m high metal fence. Provide lockable truck gate(s). Maintain fence in good repair.

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

1.05 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades as required by applicable Laws, codes and governing authorities.

1.06 WEATHER ENCLOSURES

.1 Provide weather tight closures to unfinished door and window openings, and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

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

1.07 ACCESS TO SITE

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

1.08 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

.2 Ensure public use of operational facilities is protected appropriately. Reference section 01 14 00 – Work Restrictions, for details of operational facilities.

1.09 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.10 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.11 PROTECTION OF FINISHES

.1 Provide protection for finished and partially finished finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with the Owner locations and installation of protection of finishes five (5) Working Days prior to installation.

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

1.12 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Sections 01 74 00 – Cleaning and 01 74 19 – Waste Management and Disposal.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 RELATED REQUIREMENTS

.1 Section 01 11 00 - Summary Of Work.

.2 Section 01 73 00 – Execution.

1.03 QUALITY

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

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

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

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

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

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

1.04 AVAILABILITY

.1 Immediately upon signing Contract, review Product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of Products are foreseeable, notify the Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify the Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Owner reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.05 STORAGE, HANDLING AND PROTECTION

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

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

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

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

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

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

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

.8 Remove and replace damaged Products at own expense and to satisfaction of the Consultant.

.9 Touch-up damaged factory finished surfaces at own expense and to the Consultant satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.06 TRANSPORTATION

.1 Pay costs of transportation of Products required in performance of Work, unless otherwise specified.

.2 Transportation cost of Products Supplied By Others will be paid for by the Owner. Unload, handle, store and protect such Products.

1.07 MANUFACTURER'S INSTRUCTIONS

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

.2 Notify the Consultant in writing, of conflicts between Specifications and manufacturer's instructions, so that the Consultant will establish course of action.

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

1.08 QUALITY OF WORK

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

.2 Do not employ anyone unskilled in their required duties. The Owner and the Consultant reserve the right to require dismissal from site workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with the Consultant, whose decision is final.

1.09 CO-ORDINATION

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

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

.3 Co-ordinate with the Consultant delivery times. Ensure to provide sufficient notices for large deliveries that may impact traffic or block roads.

1.10 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform the Consultant if there is interference. Install as directed by the Consultant.

1.11 REMEDIAL WORK

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

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

1.12 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform the Consultant of conflicting installation and propose alternative solution for Acceptance.

1.13 FASTENINGS

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

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

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

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.14 FASTENINGS - EQUIPMENT

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

.2 Unless otherwise specified, use heavy hexagon heads, semi-finished. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

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

1.15 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building or structures. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of the Consultant.

1.16 EXISTING UTILITIES

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

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

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 PROJECT CLEANLINESS

.1 Maintain Place of the Work in tidy condition, free from accumulation of waste material and debris.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Consultant.

.3 Do not burn waste materials on site.

.4 Make arrangements with and obtain permits from Authorities Having Jurisdiction (AHJ) for disposal of waste and debris.

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

.6 Provide and use marked separate bins for recycling. Refer to Section 01 74 19 - Waste Management and Disposal.

.7 Dispose of waste materials and debris at appropriate off-site facilities.

.8 Clean interior areas prior to start of finishing Work and maintain areas free of dust and other contaminants during finishing operations.

.9 Store volatile waste in covered metal containers and remove from premises at end of each Working Day, unless authorized otherwise by the Consultant.

.10 Provide adequate ventilation during use of volatile or noxious substances. Use of existing or new ventilation systems is not permitted for this purpose.

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

.12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate new or existing systems or facilities.

1.03 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus Products, tools, Construction Equipment not required for performance of remaining Work.

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

.3 Prior to final review, remove remaining surplus Products, tools and Construction Equipment.

.4 Remove waste materials from site at regularly scheduled times or dispose of as directed by Owner or the Consultant.

.5 Do not burn waste materials on site.

.6 Make arrangements with and obtain permits from Authorities Having Jurisdiction (AHJ) for disposal of waste and debris.

1.04 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 The Project shall generate the least amount of waste possible. Contractor shall implement processes to ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors be employed by the Contractor.

1.02 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

.2 ASTM International (ASTM)

.1 ASTM E1609 01, Standard Guide for Development and Implementation of a Pollution Prevention Program

1.03 DEFINITIONS

.1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.

.2 Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, re-modeling , repair and demolition operations.

.3 Hazardous: Exhibiting the characteristics of hazardous substances including properties such as ignitability, corrosiveness, toxicity, or reactivity.

.4 Non-hazardous: Exhibiting none of the characteristics of hazardous substances, including properties such as ignitability, corrosiveness, toxicity, or reactivity.

.5 Non-toxic: Not poisonous to humans either immediately or after a long period of exposure.

.6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

.7 Recycle: To remove a waste material from the Project site to another site for remanufacture into a new product for reuse by others.

.8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form; recycling does not include burning, incinerating, or thermally destroying waste.

.9 Return: To give back reusable items or unused products to vendors for credit.

.10 Reuse: To reuse a construction waste material in some manner on the Project site.

.11 Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.

.12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run off water.

.13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

.14 Toxic: Poisonous to humans either immediately or after a long period of exposure.

.15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

.16 Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through outgassing:

.1 Solvents in paints and other coatings;

.2 Wood preservatives; strippers and household cleaners;

.3 Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.

.4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.

.17 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 RELATED REQUIREMENTS

.1 Section 01 31 19 - Project Meetings

.2 Section 01 33 00 - Submittal Procedures

.3 Section 01 74 00 – Cleaning.

1.05 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate waste management requirements with all divisions of the Work for the Project and ensure that requirements of the Waste Management Plan (WMP) are followed.

.2 Preconstruction Meeting: During the pre-construction meeting arranged in accordance with Section 01 31 19 - Project Meetings, discuss the Contractor's Waste Management Plan and to develop mutual understanding of the requirements for a consistent policy towards waste reduction and recycling.

1.06 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Action Submittals: Provide the following Submittals for Acceptance before starting any Work of this section:

.1 WMP: Submit to the Consultant for review a draft WMP including a preliminary analysis of anticipated site-generated waste by listing a minimum of five (5) construction or demolition

waste streams that have potential to generate the most volume of material indicating methods that will be used to divert construction waste from landfill and source reduction strategies. The Owner and the Consultant may provide comments within five (05) Working Days. Update as required and resubmit to the Consultant the final WMP for Acceptance within (05) Working Days.

.2 WMP shall include, but not limited to:

.1 Material Streams: Analysis of the proposed jobsite waste being generated, including material types and quantities forming a part of identified material streams in the WMP materials removed from site destined for alternative daily cover at landfill sites and land clearing debris cannot be considered as contributing to waste diversion and will be included as a component of the total waste generated for the site.

.2 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials, and incorporate into WMP.

.3 Alternative Waste Disposal: Prepare a listing of each material proposed to be salvaged, reused, recycled or composted during the course of the Project, and the proposed local market for each material.

.4 Landfill Materials: materials that cannot be recycled, reused or composted.

.5 Landfill Options: The name of the landfill where trash will be disposed of; landfill materials will form a part of the total waste generated by the Project.

.6 Materials Handling Procedures: A description of the means by which any recycled waste materials will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.

.7 Transportation: A description of the means of transportation of the recyclable materials, whether materials will be site separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site, and destination of materials.

1.07 PROJECT CLOSEOUT SUBMITTALS

.1 Diversion Documentation: Submit as constructed information in accordance with Section 01 78 00 - Closeout Submittals as follows:

.1 Waste Management Report: Submit for this Project in a format acceptable to submittal requirements and that includes the following information:

.1 Accounting: Submit information indicating total waste produced by the Project.

.2 Composition: Submit information indicating types of waste material and quantity of each material.

.3 Diversion Rate: Submit information indicating total waste diverted from landfill as a percentage of the total waste produced by the Project.

.4 Submit copies of transportation documents or shipping manifests indicating weights of materials, and other evidence of disposal indicating final location of waste diverted from landfill and waste sent to landfill.

1.08 DELIVERY, STORAGE, AND HANDLING

.1 Storage Requirements: Implement a recycling/reuse program that includes separate collection of waste materials as appropriate to the Project waste and the available recycling and reuse programs in the Project area.

.1 Provide separate containers for reusable and/or recyclable materials such as:

.1 Metals.

.2 Wood.

.3 Plastics

.2 Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:

.1 Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.

.2 Arrange for collection by or delivery to the appropriate recycling or reuse facility.

.3 Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations.

2.01 NOT USED

.1 Not Used.

3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION

.1 Contractor is responsible for designating an on-site party or parties responsible for instructing workers and overseeing and documenting results of the WMP for the Project.

.2 Distribute copies of the WMP to the job site foreman, each Subcontractor, the Owner, the Consultant and other site personnel as required to maintain WMP.

.3 Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, composting and return methods being used for the Project to employees and Subcontractors at appropriate stages of the Project.

.4 Layout and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, composting and return:

.1 Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.

.2 Hazardous wastes shall be separated, stored, and disposed of in accordance with local regulations.

.5 Submit to the Consultant a monthly summary of waste generated by the Project including details of waste diverted for recycling:

.1 Submittal of waste summary can coincide with application for progress payment, or similar milestone event as agreed upon between the Owner and the Contractor.

.2 Monthly waste summary shall contain the following information:

.1 The amount in tonnes or m 3 and location of material landfilled,

.2 The amount in tonnes or m 3 and location of materials diverted from landfill, and

.3 Indication of progress based on total waste generated by the Project with materials diverted from landfill as a percentage.

3.02 CONTRACTOR'S RESPONSIBILITY

.1 Subcontractors shall cooperate fully with the Contractor to implement the WMP.

.2 The Contractor shall be responsible for all additional costs incurred by the Owner and the Contractor arising from the failure to comply with the WMP.

END OF SECTION

1.01 GENERALREFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

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

.1 Notify the Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request the Owner inspection.

.2 The Owner Inspection:

.1 The Owner, the Consultant and the Contractor will inspect the Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Equipment and systems: tested, adjusted and balanced and fully operational.

.4 Certificates required by Authority Having Jurisdiction submitted and approved.

.5 Operation of systems: demonstrated to Owner's personnel.

.6 Commissioning of equipment and systems: completed in accordance with 01 91 13 - GENERAL COMMISSIONING REQUIREMENTS and copies of final Commissioning Report submitted to the Consultant.

.7 Apply for certification of Substantial Performance of the Work and Ready-For-Takeover in accordance with the Contract Documents.

.8 Submit all Close-Out Documentation described in GC 5.5.1.2.and section 01 78 00 – Closeout Submittals

.9 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by the Owner and the Consultant.

.2 When Work is incomplete according to the Owner or the Consultant, complete outstanding items and request re-inspection.

1.03 FINAL CLEANING

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 SUMMARY

.1 Comply with the requirements of this section and other related sections. When the Project is being completed at multiple sites, the requirements shall be met at each location as applicable.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting with the Owner and the Consultant, in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify Project requirements.

.2 Review manufacturer's installation instructions and warranty requirements.

.3 Establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

.2 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.

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

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit to the Consultant for review and Acceptance the operating and maintenance manual (in English). Schedule the Submittal such that Acceptance is received prior to the commencement of training of O&M personnel.

.3 Following completion of training of operations and maintenance personnel, provide four hard (4) copies and an electronic copy in PDF format of finalized operations and maintenance manual.

.4 Provide spare parts, maintenance materials and special tools of same quality and manufacture as Products provided in Work.

.5 Provide evidence, if requested, for type, source and quality of Products supplied.

.6 Provide a complete set of As-Built Record Drawings sealed by an engineer licensed in the province

of Ontario.

.7 Provide all other required Closeout Documentation in accordance with the Contract Documents.

1.05 OPERATIONS AND MAINTENANCE MANUAL

.1 FORMAT

.1 Organize data as an instructional manual.

.2 Binders: Vinyl, hard covered, 3 ‘D’ ring, loose leaf [219 x 279] mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings:

.1 Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title ‘Project Record Documents’; list title of Project and identify subject matter of contents.

.5 Arrange content under section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate Product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer’s printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

.9 Provide CAD files in dwg format.

.2 CONTENTS

.1 Table of Contents for Each Volume: provide title of Project;

.1 Date of submission; names.

.2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.

.3 Schedule of Products and systems, indexed to content of volume.

.2 Include the following contents:

.1 As-Built Record Drawings

.2 Product data, and samples.

.3 Site test records.

.4 Inspection certificates.

.5 Manufacturer’s certificates.

.6 Inventory of spare parts, special tools and maintenance materials.

.7 Maintenance Management System (MMS) identification system used.

.8 WHMIS information.

.9 WHMIS Safety Data Sheets (SDS).

.10 Electrical Panel inventory containing a detailed inventory of electrical circuitry for each panel board. Duplicate of inventory inside each panel.

.11 Other documents as required and specified in other sections of Specifications.

.12 Provide digital photos, if requested, for site records.

.3 For each Product or system:

.1 List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

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

.5 Provide a set of As-Built Record Drawings that accurately reflect as-constructed, as-built or as-fabricated Work and that have been sealed by a professional engineer licensed in the Province of Ontario.

.1 Provide hard copies within the operations and maintenance manuals and electronic copies in both native CAD format and PDF.
.2 Label each document “AS-BUILT RECORD” in neat, large, printed letters.

.6 Drawings: supplement Product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.7 Typewritten Text: As required to supplement Product data.

.1 Provide logical sequence of instructions for each procedure, incorporating manufacturer’s instructions.

.7 Label record documents and file in accordance with section number listings.

.8 Maintain record documents in clean, dry and legible condition.

.1 Do not use record documents for construction purposes.

.9 Keep record documents and samples available for inspection by the Owner and the Consultant.

.10 Specifications: mark each item to record actual construction, including:

1. Manufacturer, trade name, and catalogue number of each Product actually installed particularly optional items and substitute items.

.2 Changes made by Addenda and Change Orders.

. .11 Training: Refer to Section 01 79 00 - Demonstration and Training.

.3 EQUIPMENT AND SYSTEMS

.1 For each item of equipment and each system include description of unit or system, and component parts.

.2 Give function, normal operation characteristics and limiting conditions.

.3 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.4 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.5 Include installed colour coded wiring diagrams.

.6 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.

1. Include regulation, control, stopping, shut-down, and emergency instructions.
2. Include summer, winter, and any special operating instructions.

.7 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.8 Provide servicing and lubrication schedule, and list of lubricants required.

.9 Include manufacturer's printed operation and maintenance instructions.

.10 Include sequence of operation by controls manufacturer.

.11 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.12 Provide installed control diagrams by controls manufacturer.

.13 When applicable, provide Contractor's coordination drawings, with installed colour-coded piping diagrams.

.14 When applicable, provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.15 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.16 Include test and balancing reports as specified in Section 01 45 00 - Quality Control and Section 01 91 13 - General Commissioning Requirements.

.17 Additional requirements: As specified in individual Specification sections.

.4 MATERIALS AND FINISHES

.1 Building Products, applied materials, and finishes: Include Product data, with catalogue number, size, composition, and colour and texture designations.

.1 Provide information for re-ordering custom manufactured products.

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

.2 Moisture-protection and weather-exposed Products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Additional requirements: As specified in individual Specifications sections.

1.06 FINAL SURVEY

.1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.07 MAINTENANCE MATERIALS

.1 Spare Parts:

- .1 Provide spare parts, in quantities specified in individual Specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue items.
  - .1 Submit inventory listing to the Consultant.
  - .2 Include approved listings in operation & maintenance manual.
- .5 Obtain receipt for delivered products and submit before final payment.

.2 Extra Stock Materials:

- .1 Provide maintenance and extra materials, in quantities specified in individual Specification sections.
- .2 Provide items of same manufacture and quality as items in Work.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue items.
  - .1 Submit inventory listing to the Consultant.
  - .2 Include approved listings in operation & maintenance manual.
- .5 Obtain receipt for delivered Products and submit before final payment.

.3 Special Tools:

- .1 Provide special tools, in quantities specified in individual Specification section.
- .2 Provide items with tags identifying their associated function and equipment.
- .3 Deliver to site; place and store.
- .4 Receive and catalogue items.
  - .1 Submit inventory listing to the Consultant.
  - .2 Include approved listings in operation & maintenance manual.

1.08 DELIVERY, STORAGE, AND HANDLING

.1 Store, at a location agreed with the Consultant, spare parts, maintenance materials, and special

tools in a manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

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

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged Products at own expense to the satisfaction of the Owner and the Consultant.

1.09 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to warranties and extended warranties.

.2 Submit warranty management plan, twenty (20) Working Days before planned pre-warranty meeting, to the Consultant review and Acceptance.

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

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

.5 Submit, warranty information made available during construction phase with each application for payment.

.6 Assemble approved information in binder, submit upon acceptance of Work and organize binder as follows:

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

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

.3 Obtain warranties and bonds, executed in duplicate by Subcontractors, suppliers, and manufacturers, within ten (10) days after completion of applicable item of work.

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

.5 Co-execute Submittals when required.

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

.7 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Early Occupancy or Ready-for-Takeover is verified.

.8 Conduct joint 04 month and 09 month warranty inspection, measured from date determined above in clause 1.14.7.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, Subcontractors, manufacturers, or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at 04 and 09 month post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

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

.11 Written verification to follow oral instructions.

1.10 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil- and water-resistant tag approved by Owner.

.2 Attach tags with copper wire and spray with waterproof silicone coating.

.3 Leave date of Acceptance until Project is accepted for occupancy.

.4 Indicate the following information on tag:

.1 Type of product/material.

.2 Model number.

.3 Serial number.

.4 Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.02 ADMINISTRATIVE REQUIREMENTS

.1 Demonstrate scheduled operation and maintenance of equipment and systems to Owner's personnel before date of Substantial Performance of the Work.

.2 The Owner will provide a list of personnel to receive instructions and coordinate their attendance at agreed-upon times.

.3 Preparation:

.1 Verify conditions for demonstration and instructions comply with requirements.

.2 Verify that designated personnel are present.

.3 Ensure equipment has been inspected and put into operation in accordance with specified Contract Documents.

.4 Ensure testing, adjusting, and balancing have been performed in accordance with Section 01 91 13 - General Commissioning Requirements, and equipment and systems are fully operational.

.4 Demonstration and Instructions:

.1 Demonstrate start-up, operation, control, adjustment, troubleshooting, servicing, and maintenance of each item of equipment at agreed-upon times at the designated location.

.2 Instruct personnel in phases of operation and maintenance using operations and maintenance manuals as basis of instruction.

.3 Review contents of operations and maintenance manual in detail to explain aspects of operation and maintenance.

.4 Prepare and insert additional data in operations and maintenance manuals when needed during instructions.

.5 The amount of time to be provided for instruction of each item of equipment or system shall be agreed with the Owner in advance.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit, for Acceptance, a plan including a schedule of times and dates for the demonstration of each item of equipment and each system. Ensure plan is submitted such that Acceptance is received two weeks before designated dates.

.3 Submit reports within one week after completion of demonstration, provided that demonstration

and instructions have been satisfactorily completed.

.4 Include in report time and date of each demonstration, with list of persons present.

.5 Provide sufficient copies of completed operations and maintenance manuals for use in demonstrations and instructions.

1.04 QUALITY ASSURANCE

.1 When specified in individual Sections requiring manufacturer to provide authorized representative to demonstrate operation of equipment and systems:

.1 Provide demonstration and training as per this section.

.2 Submit written report that demonstration and instructions have been completed.

END OF SECTION

1 GENERAL

1.01 SUMMARY

1.02 This section includes general requirements relating to commissioning (Cx) of Project components and systems, specifying general requirements for performance verification (PV) of components, equipment, sub-systems, systems, and integrated systems.

1.03 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-2020, Stipulated Price Contract.

1.04 RELATED REQUIREMENTS

.1 Section 01 31 19 – Project Meetings

.2 Section 01 77 00 - Closeout Procedures.

.3 Section 01 78 00 - Closeout Submittals.

.4 Section 01 79 00 - Demonstration and Training.

1.05 ABBREVIATIONS

.1 AFD: Alternate Forms of Delivery, service provider

.2 Cx: Commissioning

.3 EMCS: Energy Monitoring and Control Systems

.4 O&M: Operations and Maintenance.

.5 PI: Product Information

.6 PV: Performance Verification

.7 TAB: Testing, Adjusting and Balancing.

1.06 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:

.1 The Consultant will observe some or all commissioning activities at their discretion.

.2 Owner’s Performance Testing: Performance testing of equipment or systems by the Owner or the Consultant will not relieve Contractor from compliance with specified start-up and testing procedures.

.3 Cooperate fully with the Owner and the Consultant during stages of Acceptance and Ready-for-Takeover.

.4 Coordination with Authorities Having Jurisdiction (AHJ):

.1 Where specified start-up, testing or commissioning procedures duplicate verification requirements of AHJ, arrange for AHJ to witness procedures to avoid duplication of tests and to facilitate an earlier acceptance of equipment or facility.

.2 Obtain certificates of approval, acceptance, and compliance with rules and regulations of AHJ.

.3 Submit copies of certificates to the Consultant within three (03) days of test.

.2 Commissioning Meetings:

.1 Arrange Cx meeting(s) as per this section and in accordance with other Specification sections.

.2 Provide agenda, in accordance with section 01 91 13 – Project Meetings, a minimum of five (05) Working Days before meeting(s).

.3 Use Cx meetings to resolve issues, monitor progress, and identify defects and deficiencies relating to Cx.

.4 Continue Cx meetings on a regular basis, including during equipment start-up period, and functional testing period until commissioning deliverables have been addressed.

.5 At 60% construction completion stage arrange a separate Cx scope meeting to review progress, discuss schedule of equipment start-up activities and prepare for Cx. Additional agenda topics include the following:

.1 Review duties and responsibilities of Contractor and Subcontractors, addressing delays and potential problems.

.2 Determine the degree of involvement of Subcontractors and manufacturer's representatives in the Cx process.

.6 Ensure Subcontractors and relevant manufacturer representatives are present at 60% construction completion stage, at subsequent Cx meetings, and when otherwise required.

.3 Observation of Starting and Testing:

.1 Provide twenty (20) Working Days' notice before beginning commissioning.

.2 The Owner and the Consultant will observe start-up and testing.

.3 The Consultant and/or Owner may be present at tests performed and documented by Subcontractors, suppliers, and equipment manufacturers.

.4 Conflicts:

.1 Report conflicts between requirements of this section and other sections to the Consultant

and obtain interpretation or clarification before starting commissioning work.

.2 Failure to report conflicts and obtain interpretation or clarification will result in application of the more stringent requirement.

.5 Excess Administration:

.1 Contractor shall pay the costs related to Consultant's excess contract administration if third and subsequent verifications occur where:

.1 Verification of reported results fail to receive the Owner or Consultant's Acceptance.

.2 Repetition of second verification again fails to receive Acceptance.

.3 The Consultant deems Contractor's request for second verification was premature.

.2 The cost of the Consultant's excess contract administration will be based on a rate of $260 per hour.

1.07 ACTION AND INFORMATIONAL SUBMITTALS

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

.1 Submit, for review and Acceptance, no later than six (06) weeks after award of Contract:

.1 draft Cx documentation and

.2 preliminary Cx schedule.

.2 Request changes to Submittals in writing to the Consultant and obtain written Acceptance or rejection at least eight (8) weeks before start of Cx.

.3 Where Cx procedures are not specified, submit proposed ones to the Consultant and obtain written Acceptance at least eight (8) weeks before start of Cx.

.4 Submit additional documentation relating to Cx process as required by the Consultant.

.5 If instruments installed in Contract will be used for Cx of TAB and PV, then submit TAB and PV instrument calibration certificates for review.

.6 Submit EMCS sensor calibration certificates.

.2 Commissioning Schedule:

.1 Allow in the schedule adequate time for Cx activities such that activities are completed prior to the required occupancy date, including commissioning activities prescribed in the Specifications including:

.1 Acceptance of Cx reports

.2 Verification of reported results

.3 Repairs, retesting, re-commissioning, and re-verification

.4 Training

.3 Start-Up Documentation:

.1 Assemble start-up documentation and submit to the Consultant for review and Acceptance before beginning commissioning.

.2 Start-up documentation to include:

.1 Factory and on-site test certificates for specified equipment.

.2 Pre-start-up inspection reports.

.3 Signed installation/start-up checklists.

.4 Start-up reports.

.5 Step-by-step description of complete start-up procedures so the Consultant or Owner can repeat start-up at any time.

.4 Submit for review and Acceptance:

.1 Complete list of proposed instruments and equipment to perform commissioning.

.2 List data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.

.5 Commissioning Documentation:

.1 Submit completed Cx documentation to Consultant for review and Acceptance.

1.08 MAINTENANCE MATERIALS SUBMITTALS

.1 Supply and document maintenance materials, spare parts, and special tools as specified in other Specification sections.

1.09 SITE CONDITIONS

.1 Where Cx of weather-dependent, occupancy-dependent, or seasonally-dependent equipment or systems cannot be conducted under near-rated or near-design conditions, extrapolate part-load results to design conditions, if acceptable to the Consultant, with manufacturer's assistance in accordance with equipment manufacturer's instructions, data, and approved formulae.

2 PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.01 GENERAL

.1 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Perform Cx after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and Accepted. Complete Cx in the most effective and timely manner available.

.1 Objectives: Verify that installed equipment, systems and integrated systems operate in accordance with Contract Documents and design criteria and intent.

.2 Contractor shall be responsible for the entire Cx process, operating equipment and systems, troubleshooting, and making adjustments as required.

.1 Operate systems at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems should interact with each other as intended in accordance with Contract Documents and design criteria.

.2 Make adjustments as needed, during these checks, to enhance performance and meet environmental or user requirements.

3.02 PRE-COMMISSIONING REVIEW

.1 Before Construction:

.1 Review Contract Documents and confirm in writing to the Consultant the following:

.1 Adequacy of provisions for Cx.

.2 Aspects of design and installation pertinent to success of Cx.

.2 During Construction:

.1 Coordinate provision, location, and installation of provisions for Cx.

.3 Before Beginning Cx:

.1 Verify Cx Plan, documentation and schedules are up-to-date.

.2 Verify installation of related components, equipment, systems, and sub-systems are complete.

.3 Review Cx requirements and procedures.

.4 Verify documentation used for the Cx process is shelf-ready (bound, organized, indexed, etc.).

.5 Review design criteria and intent, and special features to ensure full understanding.

.6 Submit complete start-up documentation to Consultant for Acceptance.

.7 Verify systems have been cleaned thoroughly.

.8 Complete TAB procedures on systems and submit TAB reports to Consultant for review and Acceptance.

.9 Verify “As-Built” system schematics are available.

.4 Inform Consultant in writing of defects and deficiencies in installed Work together with plan for rectification.

3.03 STARTING AND TESTING

.1 Contractor to bear all costs associated with Cx activities, including, but not limited to, costs of the following:

.1 inspections, including disassembly and re-assembly after approval, and for starting, testing, adjusting, and;

.2 temporary testing equipment.

.3 required personnel and test equipment.

3.04 PERFORMANCE VERIFICATION TOLERANCES

.1 Application Tolerances:

.1 A specified range of acceptable deviations of measured values from specified values or specified design criteria except for special areas that shall be within +/- 10% of specified values.

.2 Instrument Accuracy Tolerances:

.1 To be of higher order of magnitude than equipment or system being tested.

.3 Measurement Tolerances During Verification:

.1 Unless otherwise specified, actual values shall be within +/- 2% of recorded values.

3.05 MANUFACTURER SERVICES

.1 During factory testing, manufacturer, through the Contractor, to:

.1 Coordinate time and location of testing.

.2 Arrange for Consultant to observe testing.

.3 Submit testing documentation for review and Acceptance by Consultant.

.4 Obtain written Acceptance of test results and documentation from the Consultant before delivery to site.

.2 Obtain manufacturer’s installation, start-up and operations instructions before start-up of

components, equipment and systems, and review with Consultant.

.1 Compare completed installation with manufacturer's published data, record discrepancies, and review with manufacturer.

.2 Modify procedures that may be detrimental to equipment performance and review with manufacturer before start-up.

.3 Integrity of warranties:

.1 Use manufacturer's trained start-up personnel where specified in other Specification sections or where required to maintain integrity of warranty.

.2 Verify with manufacturer that testing as specified will not void warranties.

.4 Qualifications of manufacturer's personnel:

.1 Experienced in design, installation and operation of equipment and systems.

.2 Ability to interpret test results accurately.

.3 Report results in clear, concise, logical manner.

3.06 COMMISSIONING PROCEDURES

.1 Verify that equipment and systems are complete, clean, and operating in a normal and safe manner before conducting start-up, testing and Cx.

.2 Conduct start-up and testing in the following distinct phases:

.1 Included in delivery and installation:

.1 Verification of conformity to Specification, reviewed and Accepted Shop Drawings and completion of PI report forms.

.2 Visual inspection of quality of installation.

.2 Start-up: Follow accepted start-up procedures.

.3 Operational testing: Document equipment performance.

.4 System PV: Include repetition of tests after correcting deficiencies.

.5 Post-Substantial Performance Verification: To include fine-tuning.

.3 Correct deficiencies and obtain Acceptance from the Consultant after distinct phases have been completed and before beginning the next phase.

.4 Document required tests on approved PV forms.

.5 Failure to follow accepted start-up procedures may result in re-evaluation of equipment by an independent testing agency selected by the Owner. If evaluation report indicates that equipment start-up procedure was deficient and resulted in equipment damage, perform the following:

.1 Minor equipment/systems: Perform corrective measures acceptable to the Consultant .

.2 Major equipment/systems: If evaluation report indicates that equipment damage is minor, perform corrective measures acceptable to the Consultant.

.3 If evaluation report indicates that major equipment damage has occurred, the Consultant will reject equipment.

.1 Remove rejected equipment from site and replace with new equipment.

.2 Perform specified start-up procedures on new equipment/systems.

3.07 OPERATION AND MAINTENANCE OF EQUIPMENT AND SYSTEMS

.1 After start-up, operate and maintain equipment and systems as directed or recommended by equipment/system manufacturer.

.2 With manufacturer's assistance, develop written maintenance program and submit to Consultant for review and Acceptance before implementation.

.3 Operate and maintain systems for length of time required for commissioning to be completed.

.4 After completion of commissioning, operate and maintain systems until issuance of certificate of Substantial Completion.

3.08 TEST RESULTS

.1 If start-up, testing, or PV produce unacceptable results, repair, replace or repeat specified starting or PV procedures until acceptable results are achieved.

.2 Provide labor and materials and assume costs for re-commissioning.

3.09 START OF COMMISSIONING

.1 Notify Consultant at least ten (10) Working Days before start of Commissioning

.2 Start Cx after elements affecting start-up and performance verification of systems have been completed.

3.10 TEMPORARY INSTRUMENTS AND EQUIPMENT

.1 Provide all required instruments and equipment required to complete commissioning.

3.11 COMMISSIONING PERFORMANCE VERIFICATION

.1 Carry out Cx:

.1 under actual and accepted simulated operating conditions, over entire operating range, and in all modes, and

.2 on independent systems and interacting systems.

.2 Cx procedures to be repeatable and reported results are to be verifiable.

.3 Follow equipment manufacturer's operating instructions.

.4 Where applicable, make EMCS trending information available as supporting documentation for performance verification.

3.12 EXTENT OF VERIFICATION

.1 Laboratory areas:

.1 Provide labour and instrumentation to verify up to 100% of reported results.

.2 Elsewhere:

.1 Provide labour and instrumentation to verify up to 30% of reported results, unless otherwise specified in other Specification sections.

.3 Number and location to be at discretion of the Consultant.

.4 Conduct tests repeated during verification under same conditions as original tests, using same test equipment, and instrumentation.

.5 Review and repeat commissioning of systems if inconsistencies found in more than 20% of reported results.

.6 Perform additional commissioning until results are Acceptable to the Consultant.

3.13 INSTALLED INSTRUMENTATION

.1 Use instruments installed under Contract for TAB and PV if:

.1 Accuracy complies with this Specification section.

.2 Calibration certificates have been submitted to Consultant.

.2 Calibrated EMCS sensors may be used to obtain performance data if sensor calibration has been completed and accepted.

3.14 DEFICIENCIES DISCOVERED DURING COMMISSIONING

.1 Correct defects and deficiencies found during the Cx process. Re-verify equipment and components within the defective or deficient system to verify proper performance, including related systems if requested by the Consultant.

.2 Costs associated with re-commissioning defective and deficient work is the responsibility of Contractor.

3.15 MISCELLANEOUS CHECKS AND ADJUSTING

.1 Make adjustments and changes which become apparent as Cx proceeds.

.2 Perform static and operational checks as applicable and as required.

3.16 DEFICIENCIES AND DEFECTS

.1 Correct deficiencies and defects found during start-up and Cx to satisfaction of Owner and the Consultant.

.2 Report concerns, deficiencies, and defects affecting Cx to Owner and the Consultant in writing. Stop Cx until problems are rectified. Proceed only with written Acceptance from the Consultant.

3.17 CLOSEOUT ACTIVITIES

.1 Completion of Commissioning:

.1 Upon completion of Cx, leave systems in normal operating mode, unless otherwise agreed with the Consultant.

.2 Except for warranty and seasonal verification activities specified in Cx Specifications, complete Cx before issuance of Substantial Completion Certificate of Completion.

.3 Cx to be considered complete when contract Cx deliverables have been submitted and Accepted by the Consultant.

.2 Activities Upon Completion of Commissioning:

.1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

.3 Training:

.1 In accordance with Section 01 79 00- Demonstration and Training.

END OF SECTION

APPENDIX H - SHOP DRAWINGS

Refer to the Shop Drawings as outlined below, and which are attached to this Appendix H.

Drawing No.	Description	Date
Northern Transformer Incorporated		
TB 4256	2000 Flit. 2667 KVA Oil Filled Transformer	August 11, 1987
TB 4257	Rating Plate and Diagram of Connections	
9575A	Bill of Material	April 21,1988
88-205-474-401	480V SWGR Type ‘SR’ Outdoor 3-Line Schematic	April 24, 1988
88-205-474-402	48OV Indoor Switchgear Type ‘R’ Breaker Control Schematic (Typical)	April 20, 1988
88-205-474-403	48OV Switchgear Outdoor Type ‘SR’ Wiring Diagram – Miscellaneous Equip.	
88-205-474-404	48OV Switchgear Outdoor Type ‘SR’ Side View & Bolting ARRG’T	
88-304-536-402	Bus Conn. To XFMR L.H. 3500A.AL.	April 22, 1988

NORTHERN TRANSFORMER
INCORPORATED

ONAN SEALED TRANSFORMER

SERIAL No. 87-344 DATE OF MFR. 1987

2000 kVA 3 PHASE 60 Hz

IMPEDANCE PER CENT AT 85° C

CORE & WINDINGS 2135 Kgs

TANK & FITTINGS 1745 Kgs

OIL 1490 LITRES 1280 Kgs

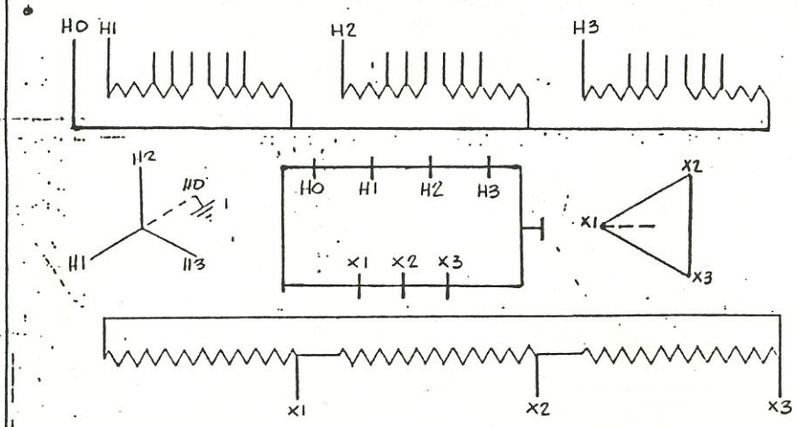
TOTAL MASS 5160 Kgs

SUITABLE FOR ONAF RATING OF 2667 kVA

VOLTS	TAP POSN	AMP	BETWEEN	VOLTS	AMP	BETWEEN
26187	1	44.1				
25564	2	45.2				
24940	3	46.3	H1 H2 H3	480	2406	X1 X2 X3
24317	4	47.5				
23693	5	48.7				

APPROVED
S. Fournier
AUG 24 1987

669 - 1853
367 - 8221
162 THROND DR
THORNHILL



CAUTION:

Do not operate tap switch with transformer energized

SPECIFICATION CSA C88-1968		
INSULATION LEVEL	HV 125 kV	LV 30 kV
MAXIMUM TEMPERATURE RISE	65°C	
WINDING MATERIAL	ALUMINUM	
TANK PRESSURE	+8 PSI / -14.7 PSI	
PURCHASERS SERIAL No.		

PLATE # B100-015-021

DESIGN IMPEDANCE — _____

NOTE - TEST IMPEDANCE WILL BE SHOWN ON NAMEPLATE.

Northern Transformer
INCORPORATED

NO.	DATE	BY	REVISIONS
1			
2			
3			
4			
5			

FOR: POWERTEL PO# 10590

Drawing Title: Rating plate and Diagram of connections

Drawn By: R.Z. Scale: ~ Date: Oct-5-87 Approved:

Material No. 87-344

Drawing No. TB 4057

PAINT: EQUIPMENT GREEN

TANK SIZE: 60" L. x 29 W. x 64" H.

ESTIMATED WEIGHTS	Lb.	kg.
CORE & COILS	4700	2135
TANK & FITTINGS	3840	1745
OIL 328 GAL. 1490 LT	2815	1280
TOTAL	11355	5160

Northern Transformer
INCORPORATED

SCALE: —

APPROVED BY:

DRAWN BY GR

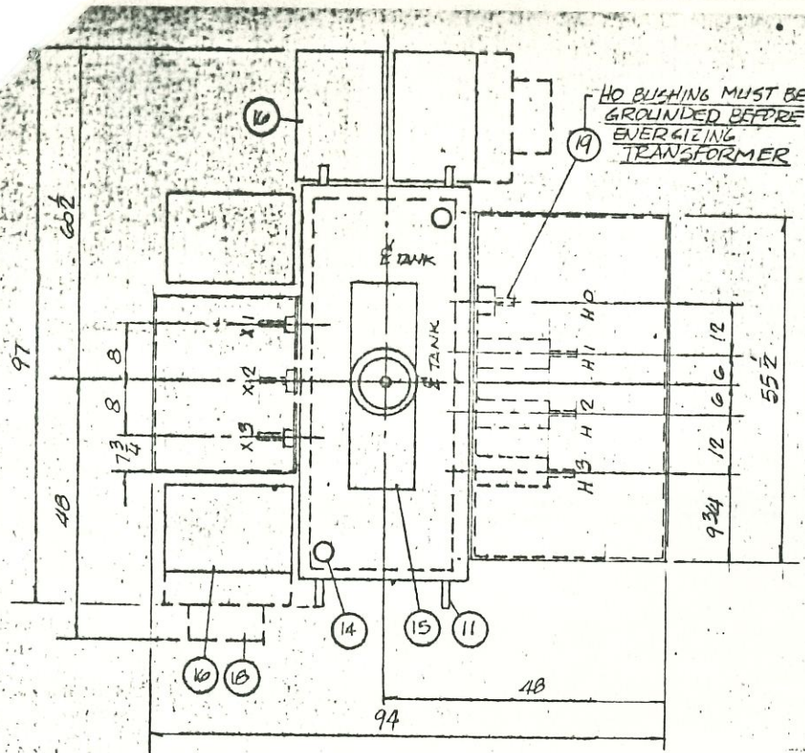
DATE: 8-11-87

REVISED

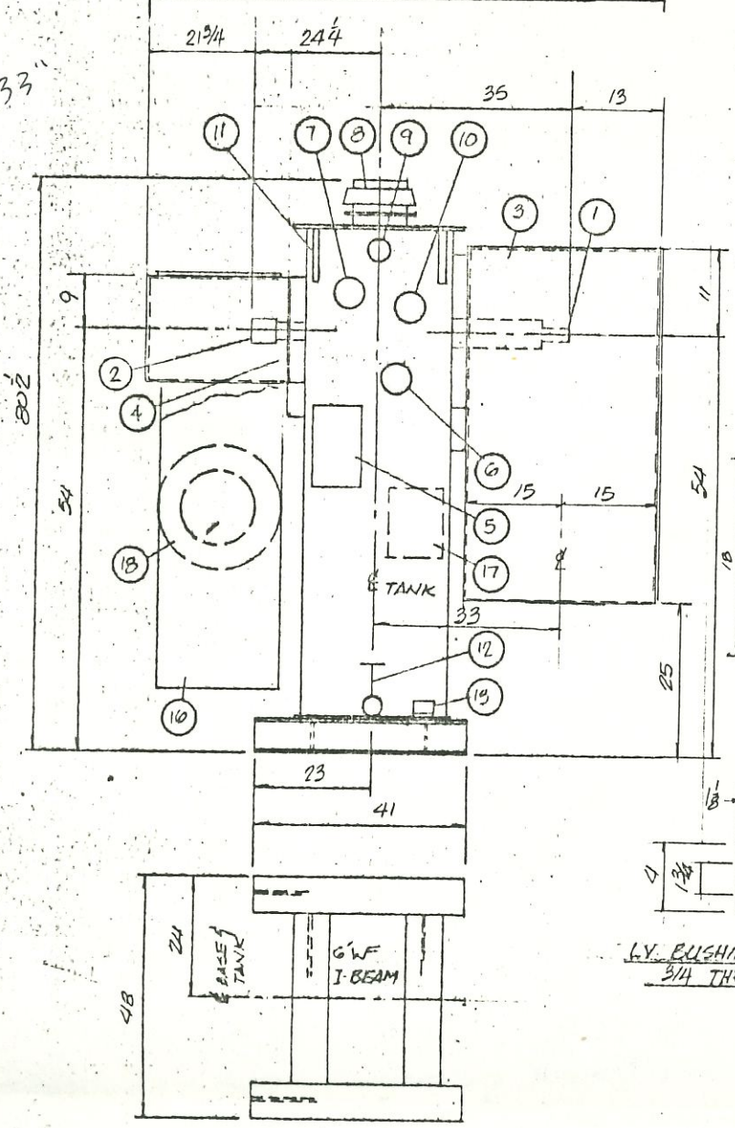
2000 KVA 2667 KVA OIL FILLED TRANSFORMER ONAN/ONAF AT 24940 GRD.Y/14400 - 480 Δ 3PH, 60Hz, 65°C RISE 20# 87-344

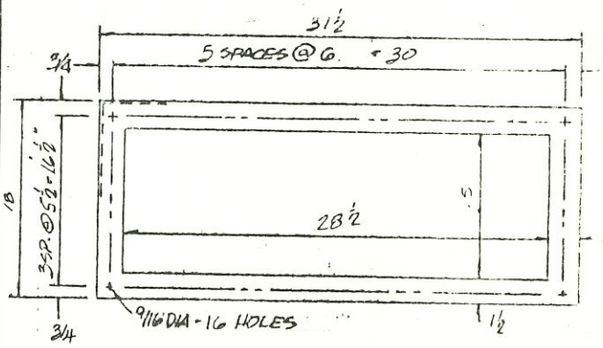
FOR: POWER TEL PO # 10590

DRAWING NUMBER TB.4256

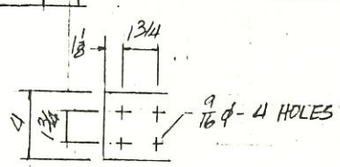


1. 3 HV BUSHINGS 34.5kv, 200kv BIL, 400A SMITH & STONE N.T. # TA3780 S/E DETAIL
2. 3 LV BUSHINGS 6.8kv, 45 kv BIL, 3500A POLYCAST 002 SEE DETAIL
3. HV CABLE BOX 55½ x 40 x 30 DEEP C/W BOTTOM ENTRY PLATE & REMOVEABLE FRONT ACCESS PLATE
4. LV THROAT SEE DETAIL
5. RATING PLATE SEE DRG # TB 4257
6. TAP SWITCH HANDLE
7. MAGNETIC OIL GAUGE QUALITROL 1-30 AC
8. PRESSURE RELIEF DEVICE QUALITROL 208-60 U
9. PRESSURE VACUUM GAUGE QUALITROL 30-5
10. TOP LIQUID THERMO. C/W 2 SETS OF CONTACTS QUALITROL 167-124-01
11. TRANSFORMER LIFTING LUGS
12. 1" DRAIN VALVE C/W BRASS PLUG
13. 2 - STAINLESS STEEL GROUND PADS C/W 2 - ½ UNC TAPPED HOLES @ 1¾ CTRS.
14. 1" FILTER PRESS CONNECTION CAPPED
15. HANDHOLE C/W BOLTED COVER
16. COOLING RADIATORS
17. FUTURE FAN CONTROL BOX
18. FUTURE FANS
19. HV NEUTRAL BUSHING PERMALI ECO 74-1

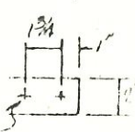




LV THROAT DRILLING PATTERN



LV BUSHING SPADE DETAIL 3/4 THK



HV BUSHING SPADE DETAIL 5/16 THK.

APPROVED
S. Berman
AUG 24 1987

PAINT: EQUIPMENT GREEN
TANK SIZE: 60" L. x 29" W. x 64" H.

ESTIMATED WEIGHTS	Lb.	kg.
CORE & COILS	4700	2135
TANK & FITTINGS	3840	1745
OIL 328 GAL. 1490 LT	2815	1280
TOTAL	11355	5160

Northern Transformer INCORPORATED

SCALE: —	APPROVED BY:	DRAWN BY GR
DATE: 8-11-87		REVISED

2000 KVA. 2667 KVA OIL FILLED TRANSFORMER C/W FUT. AF
24940 GRD. Y / 14400 - 480 Δ 3PH, 60Hz, 65°C RISE 20" BIL-34.4kv

FOR: POWER TEL PO # 10590

DRAWING NUMBER TB 4256

SIEMENS

BILL OF MATERIAL

DWG# 9575A

ORDER # A72-2242	DWG# 88-111-003-601	REV# 01	SH1 OF 4
CUSTOMER ONTARIO NORTHLAND	EQUIPMENT 'SR' O/D 600V GEAR	APRIL 21/88	H.K.

ITEM #	QT'Y	DESCRIPTION	PART #	SUPPLIER	DESIGNATION	REF.MOUNTING
1	4	800A, DRAW-OUT AIR MAGNETIC CIRCUIT	RLX800	S/A		
		BREAKER' ELECTRICALLY OPERATED C/W				
		SOLID STATE TRIPPING DEVICE				
		SHORT/LONG TIME (WITH TARGETS),				
		TRIPPING TRANSFO. 800/1A				
		W.D.#18-738-602-455				
		S.S.T.D.#				
2	2	SAME AS 1, BUT TRIPPING TRANSFO.	RLX800	S/A		
		400/1A				
3	2	PROVISION FOR FUTURE RLX-800 BRKRS.				
4	2	CURRENT TRANSFO. 3000/5A	MODEL 120	CROMPTON		
		(BUS MOUNTED)				
5	2	POTENTIAL TRANSFO. 480/120V	18-644-502-001	S/A		
6	1	VOLTMETER (0-600V)	077-08VAPZSJ	CROMPTON		
7	1	SWITCH (VOLTMETER)	RP1B35V	CROMPTON		

ANIK ENGINEERING LTD.
TORONTO, ONTARIO, CANADA

APPROVED X
APPROVED AS NOTED ☐
NOT APPROVED - REVISE & RESUBMIT ☐
BY: J.W. Lake DATE: MAY 12/88

THIS APPROVAL DOES NOT RELIEVE THE SUPPLIER OR CONTRACTOR FROM RESPONSIBILITY OF MEETING SPECIFIED REQUIREMENTS AND ALL APPLICABLE CODES.

SIEMENS

BILL OF MATERIAL

DWG# 9575A

ORDER # A72-2242	DWG# 88-111-003-601	REV# 01	SH. 2 OF 4
CUSTOMER ONTARIO NORTHLAND	EQUIPMENT 'SR' O/D 600V GEAR	APRIL 21/88	H.K.

ITEM #	QT'Y	DESCRIPTION	PART #	SUPPLIER	DESIGNATION	REF.MOUNTING
8	1	AMMETER (0-3000A)	07-08AALSUA	CROMPTON		
9	1	AMMETER SWITCH	RP1B34V79	CROMPTON		
10	1	ARTIFICIAL NEUTRAL 2A	DDA-2004	FPL		
		C/W GROUNDING RESISTOR				
11	1	GROUND FAULT RELAY GADD	GADD-2-1	FPL		
12	1	ADAPTAHORN (GRAY FLUSH)	870 120V, 60HZ	UNION		
13	2	600V, 3P FUSE PULLOUTS	15-171-861-297	S/A		
14	6	FUSES, 600V, 3A.	ATT-3A	GOULD		
15	1	FUSE HOLDER, 250V , 3 POLE	00-871-232-109	S/A		
16	2	FUSES, 250V, 6A	NON-6	BUSS		
16A	1	DUMMY FUSE	18-158-935-001	S/A		
17	2	3-WAY LIGHT SWITCHES, 15A, 120V	3403-G	NEDCO		

ANIK ENGINEERING LTD.
TORONTO, ONTARIO, CANADA

APPROVED X
APPROVED AS NOTED
NOT APPROVED - REVISE & RESUBMIT

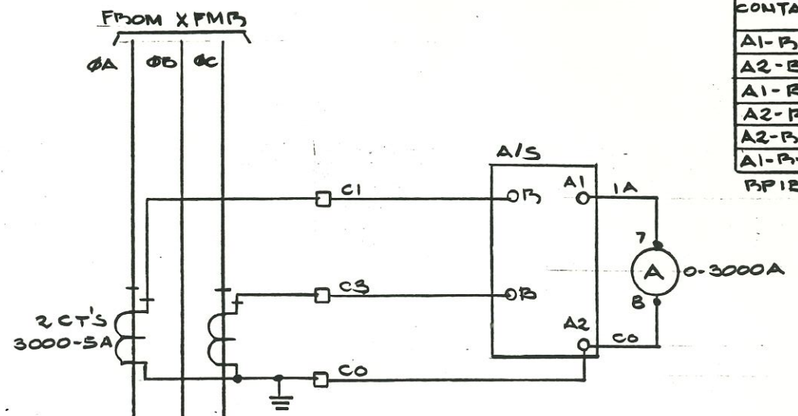
BY: [signature] DATE: 04/12/88

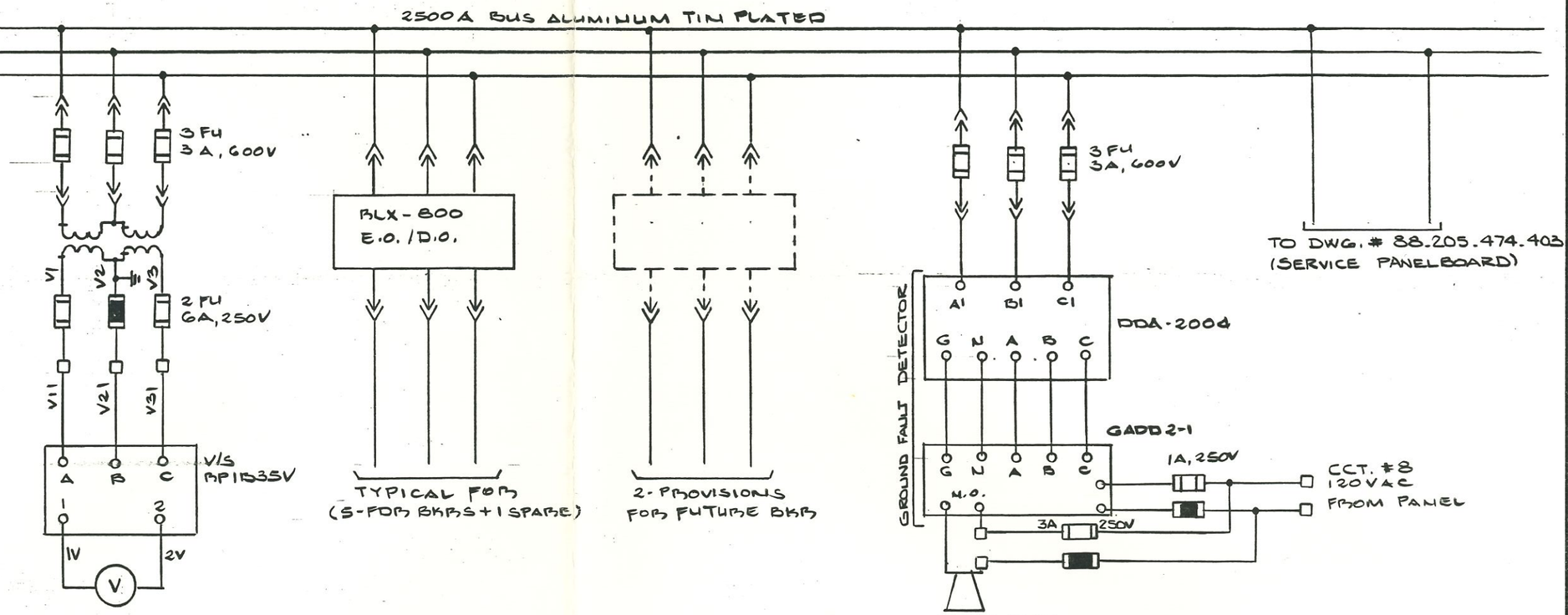
THIS APPROVAL DOES NOT RELIEVE THE SUPPLIER OR CONTRACTOR FROM RESPONSIBLITY OF MEETING SPECIFIED REQUIREMENTS AND ALL APPLICABLE CODES.

AMMETER SWITCH
A/S - CROMPTON

CONTACTS	POSITIONS 1	2	3	4
A1-B		X		
A2-B		X		
A1-B				X
A2-B				X
A2-B-B	X			
A1-B-B			X	

BPIB34V7J





VOLTMETER SWITCH
V/S CROMPTON

CONTACTS	POSITIONS 1	2	3	4
1-A		X		X
2-B		X		
1-B			X	
2-C			X	X

BPIB35V

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REVISION	DATE	BY		DATE	BY	CUSTOMER
01 FOR APPROVAL			DRAWN	4-21-88	STB	ONTARIO NORTHLAND
02 REV	30-5-88	JS	CHEK'D			
			VERIF'D	01/9/88	HK	ORDER NO.

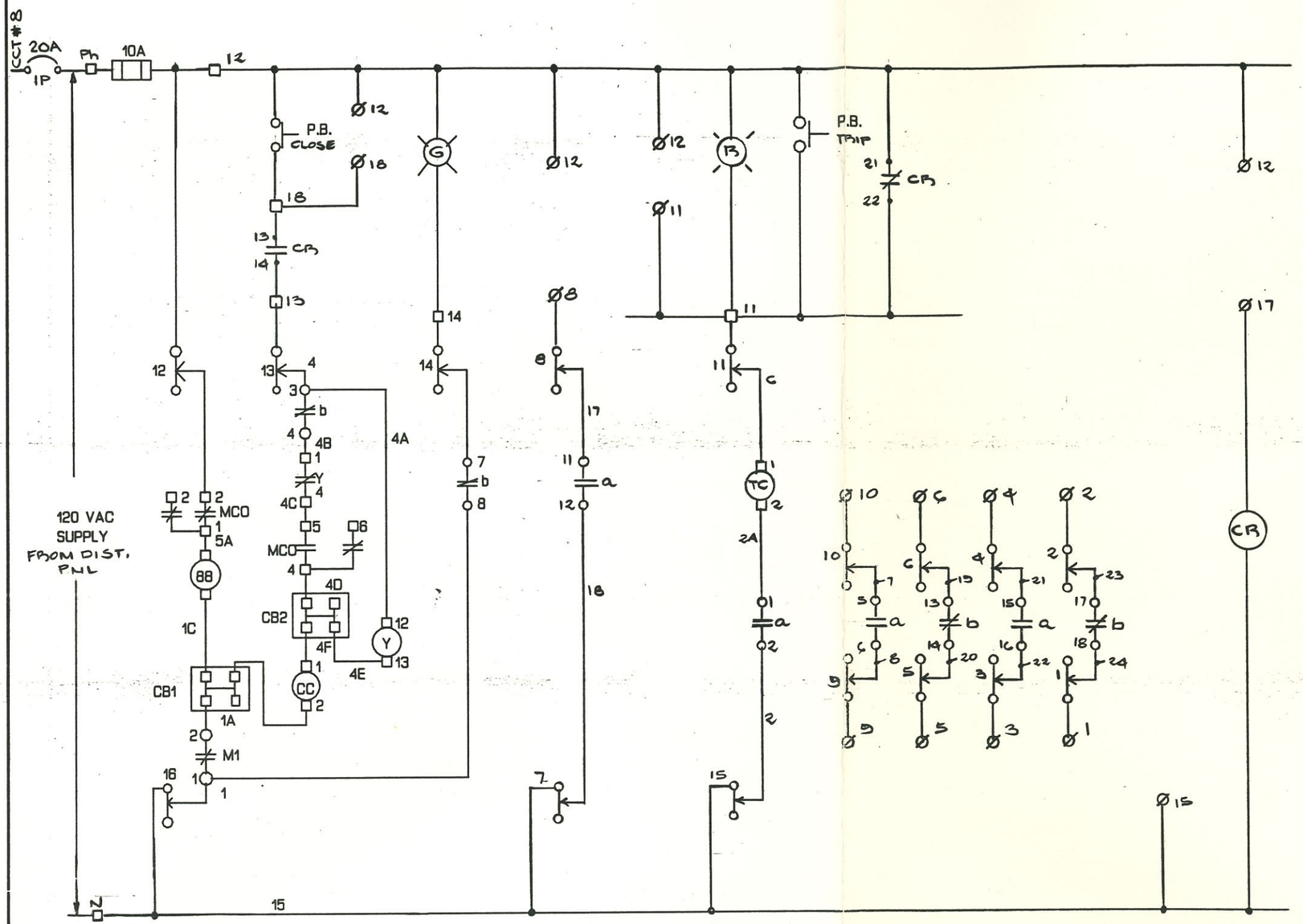
SIEMENS

TITLE 480V SWGR TYPE 'SR' OUTDOOR
3-LINE SCHEMATIC

REF.NO. A74-2242

DWG.NO. 88-205-474-401 02

transtex 20 4 85



DEVICE LIST

52CC - CLOSING COIL (SPRING RELEASE).
52TC - SHUNT TRIP COIL.
88 - SPRING CHARGING MOTOR.
MCO - MOTOR CUT OFF SWITCH .
MI - MECHANICAL INTERLOCK .
Y - CLOSING RELAY ANTI PUMP.
a - AUX. SWITCH OPEN WHEN BREAKER IS OPEN.
b - AUX. SWITCH CLOSED WHEN BREAKER IS OPEN.
AL - ALARM RELAY.
STD - STATIC TRIP DEVICE ON BREAKER, (GRD. SENSING) (3W) 3WIRE.
Ø - TERMINALS FOR CUST. CONN.
CR - SAFETY INTERLOCK RELAY

REVISION	DATE	BY		DATE	BY
01 FOR APPROVAL			DRAWN	4-22-88	STB
02 REV.	30-5-88	JS	CHEK'D		
			VERIF'D	01/4/88	HK

CUSTOMER: ONTARIO NORTHLAND

ORDER NO.

SIEMENS

TITLE: 48.0V INDOOR SWITCHGEAR TYPE 'R' BREAKER CONTROL SCHEMATIC (TYPICAL)

REF.NO. A74-2242 / W.2082

DWG.NO. 88-205-474-402 02

FROM DWG. # 88-205-474-401

2 CLF 30A, 600V

CPT, 1Ø, 10KVA @ 80-240/120V

ØA-1 — ØA-12 — AC1

ACo

ØB-1 — ØB-12 — AC2

#4 AWG-600V

#4 AWG-600V

6N

NEUTRAL BUS

2P ACB 100A

1P 15A

2P 15A

TO RECEPTACLES 3P 5P

2P

4P

6P CUBICLE & BREAKER HTR

6P TO BKR CONTROL CCT AND GROUND FAULT ALARM

ØA ØB

PANELBOARD TYPE NLAB 120/240 VAC, 1Ø

AISLE HTR 2000W 240V GRD

1 2

TO PNL GRD. BUS

THERMOSTAT

6P1

HTR'S

(1)

(*)

CELL #1

CELL #2

CELL #3

CN

CUBICLE HEATERS

(1) 500W, 240V HEATERS

(*) 50W, 120V HEATERS

INCORRECT

DETAIL "C"

2-40W FLUORESCENT (LOW TEMP. BALLAST)

1C 1N TO PNL

1A 1B 1P

SW-1 SW-2

REC. 1

TO PNL 3P 3N TO PNL

REC. 2

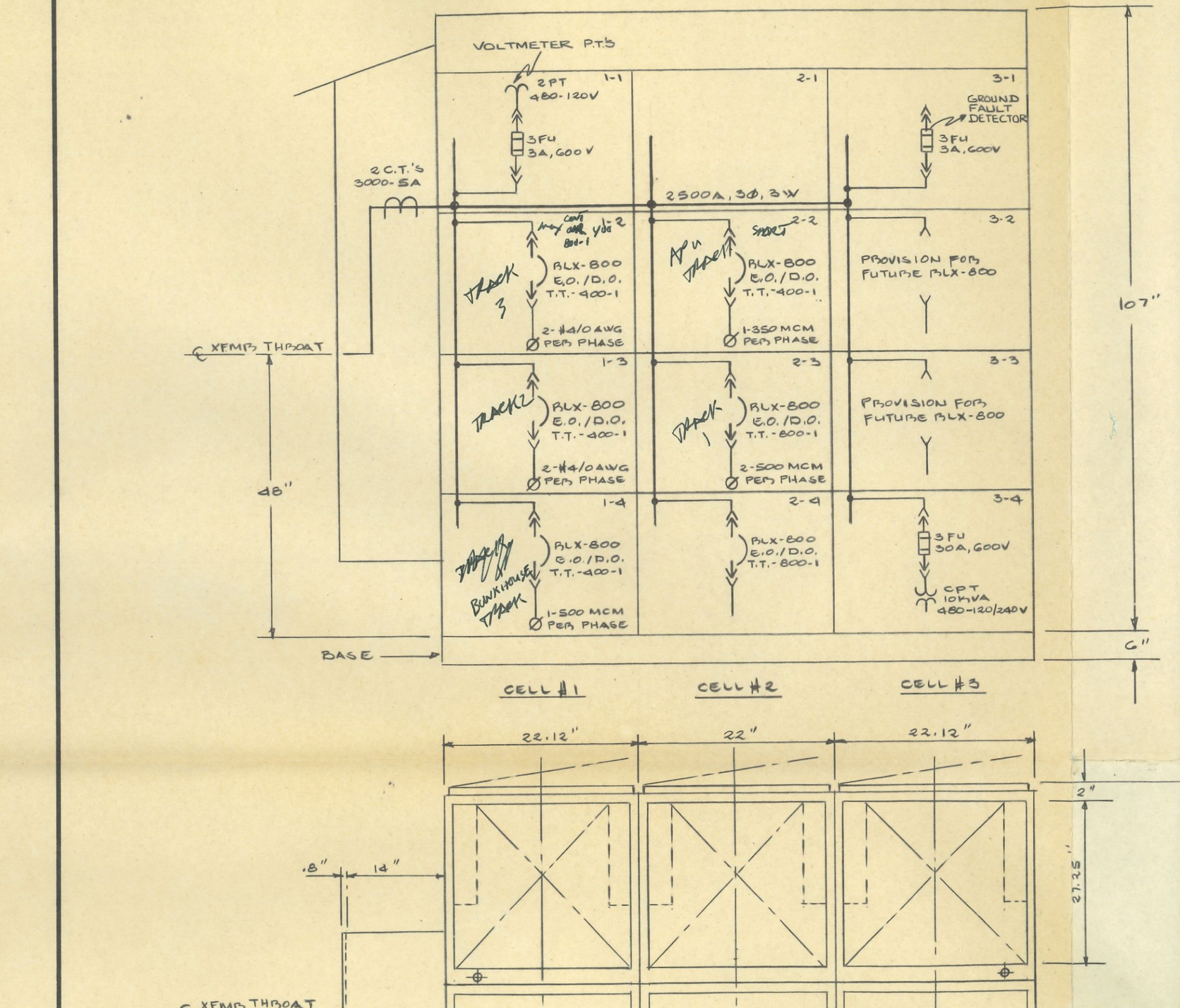
TO PNL 5P 5N TO PNL

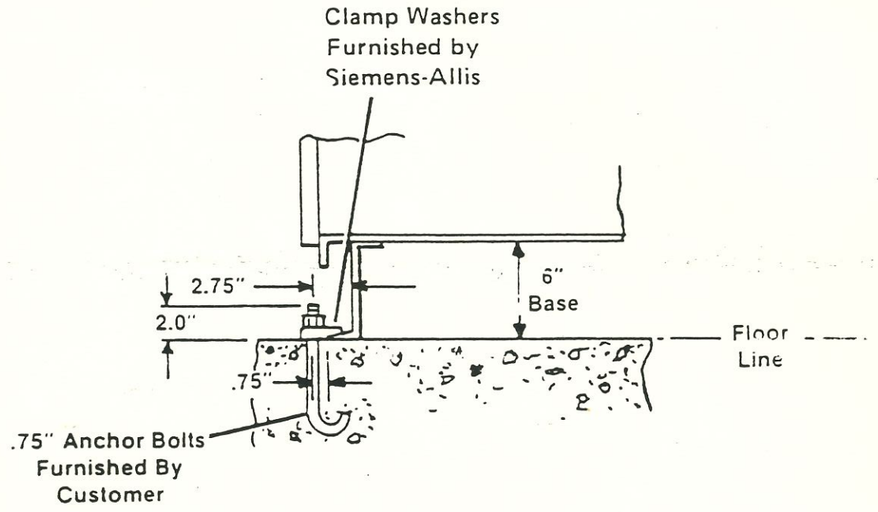
NOTE:

- WIRES FROM PANEL BOARD ARE #12 TBS
- CUBICLE HEATER WIRES #12 ASBESTOS

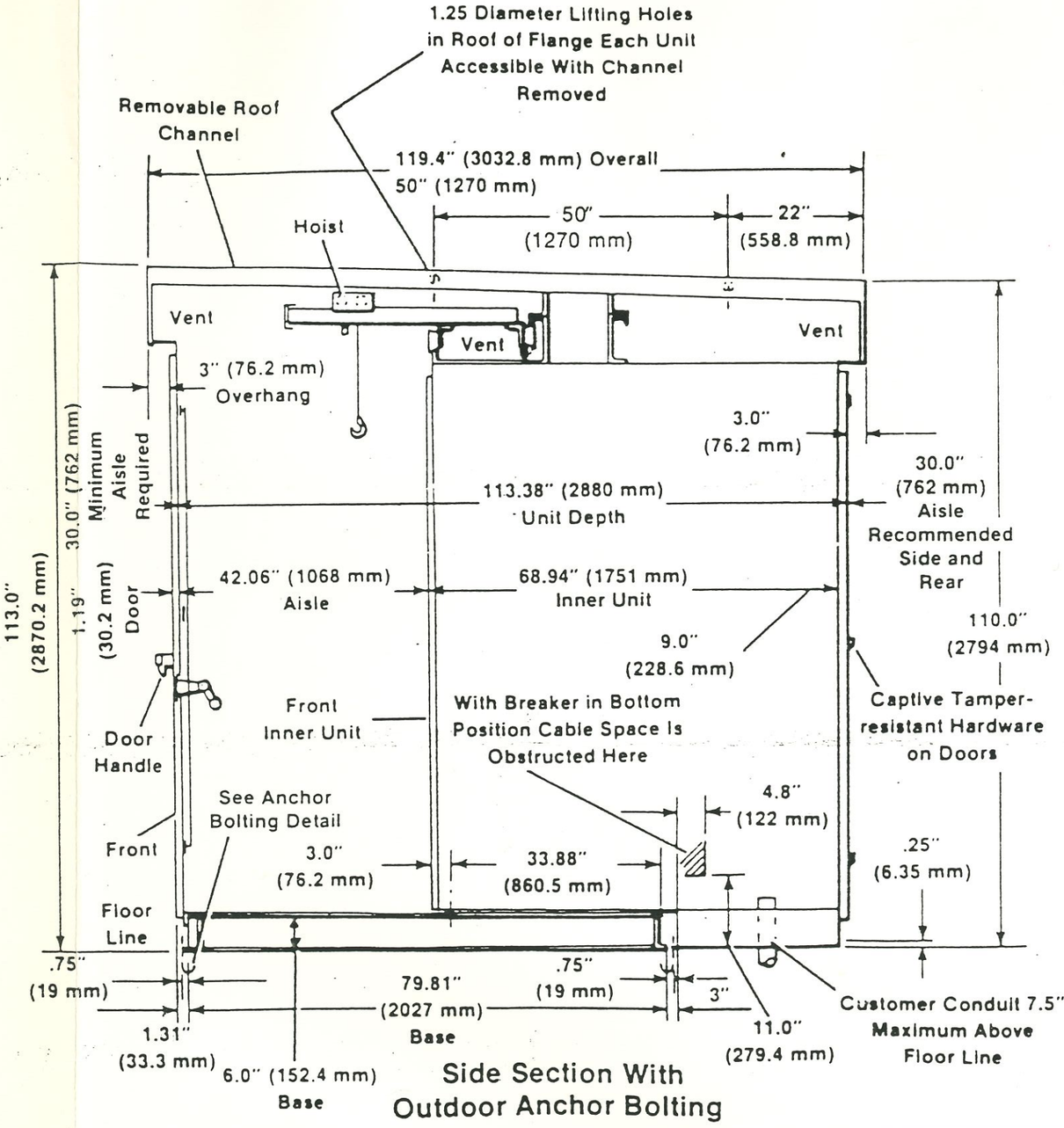
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01 FOR APPROVAL			DRAWN	4-20-88	STB	ONTARIO NORTHLAND	SIEMENS			
02 REV.	30-5-88	JS	CHEK'D					REF.NO. A74-2242/W 2082	DWG.NO. 88-205-474-403	02
			VERIF'D	24/6/88	HK	ORDER NO.				

1102


VOLTMETER P.T.S
2PT
480-120V
1-1
2-1
3-1
GROUND FAULT DETECTOR
3FU
3A, 600V
2 C.T.'s
3000-5A
2500A, 3Ø, 3W
2-2
3-2
BLX-800
E.O./D.O.
T.T.-400-1
1-350 MCM PER PHASE
PROVISION FOR FUTURE BLX-800
1-3
2-3
3-3
2-#4/0 AWG PER PHASE
2-500 MCM PER PHASE
1-4
2-4
3-4
BLX-800
E.O./D.O.
T.T.-800-1
3FU
30A, 600V
CPT
10KVA
480-120/240V
1-500 MCM PER PHASE
℄ XFMR THROAT
48"
BASE
107"
6"
CELL #1
CELL #2
CELL #3
22.12"
22"
22.12"
2"
27.25"
.8"
14"
℄ XFMR THROAT



Side View
Outdoor Bolting Arrangement



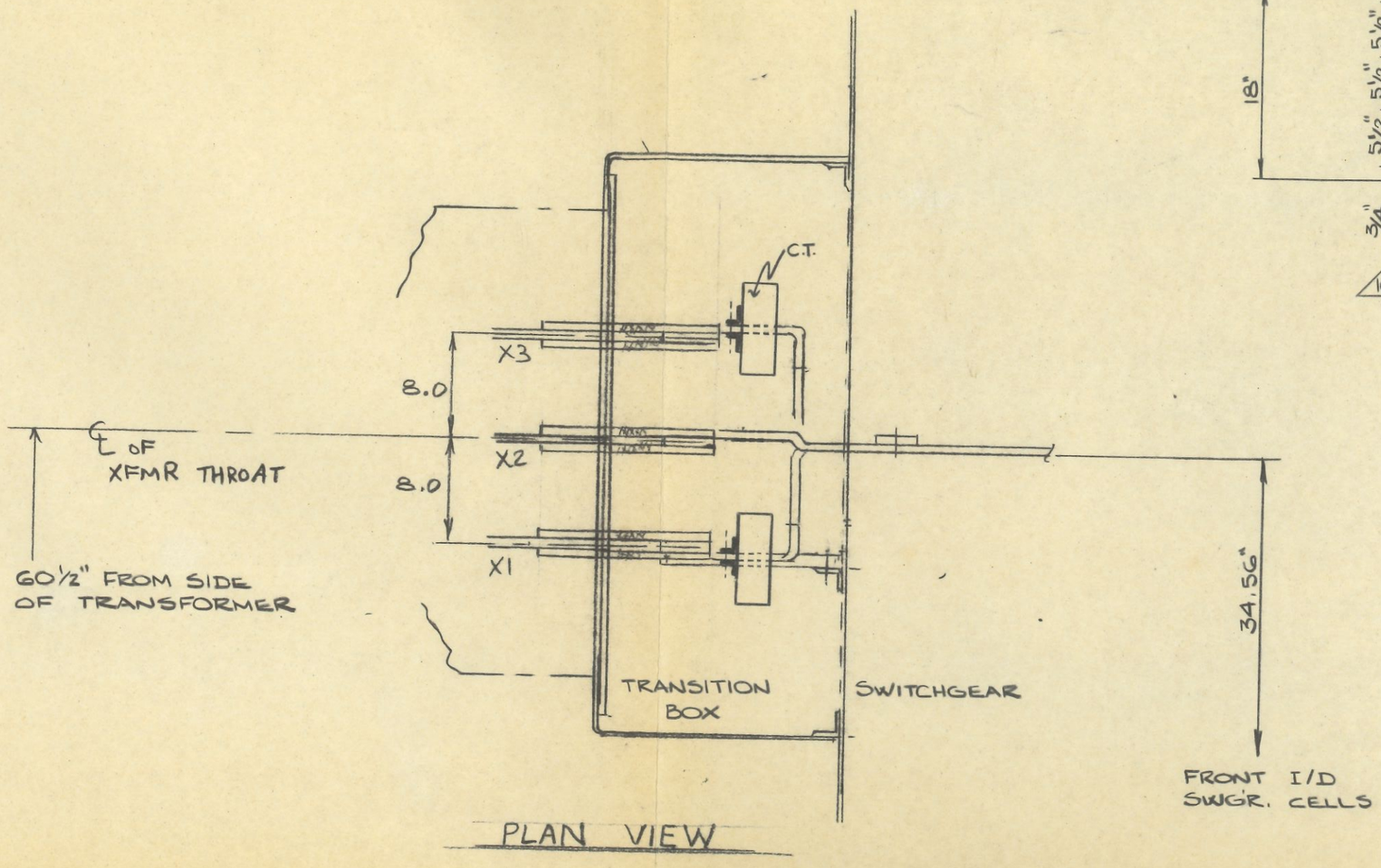
Side Section With
Outdoor Anchor Bolting

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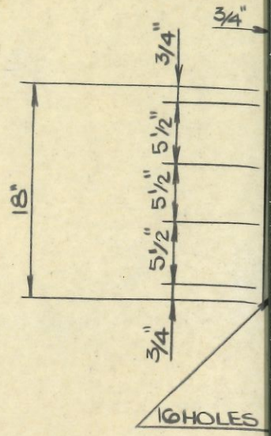
REVISION	DATE	BY		DATE	BY	CUSTOMER		TITLE 480V SWITCHGEAR OUTDOOR TYPE 'SM' SIDE VIEW & BOLTING ARRG'T		
01 FOR APPROVAL			DRAWN	4-20-88	STB	ONTARIO NORTHLAND	SIEMENS			
			CHEK'D					REF.NO. A74-2242	DWG.NO. 88-205-474-404	01
			VERIF'D	21/4/88	HK	ORDER NO.				

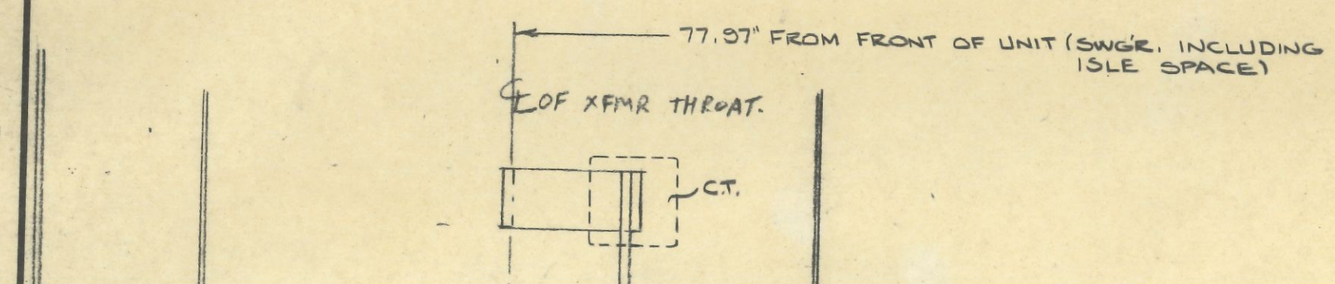
transtex

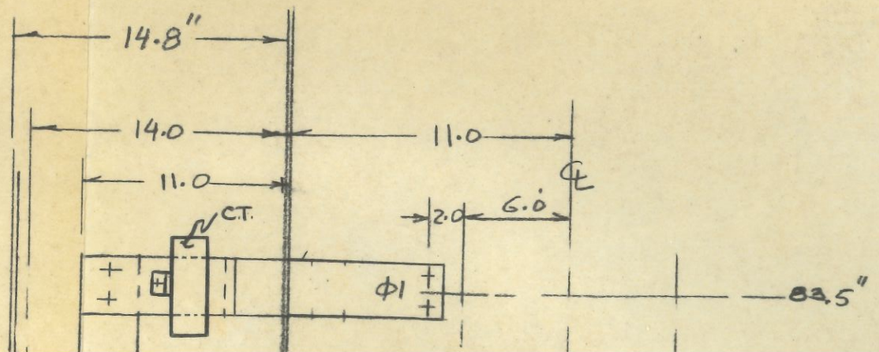
1102

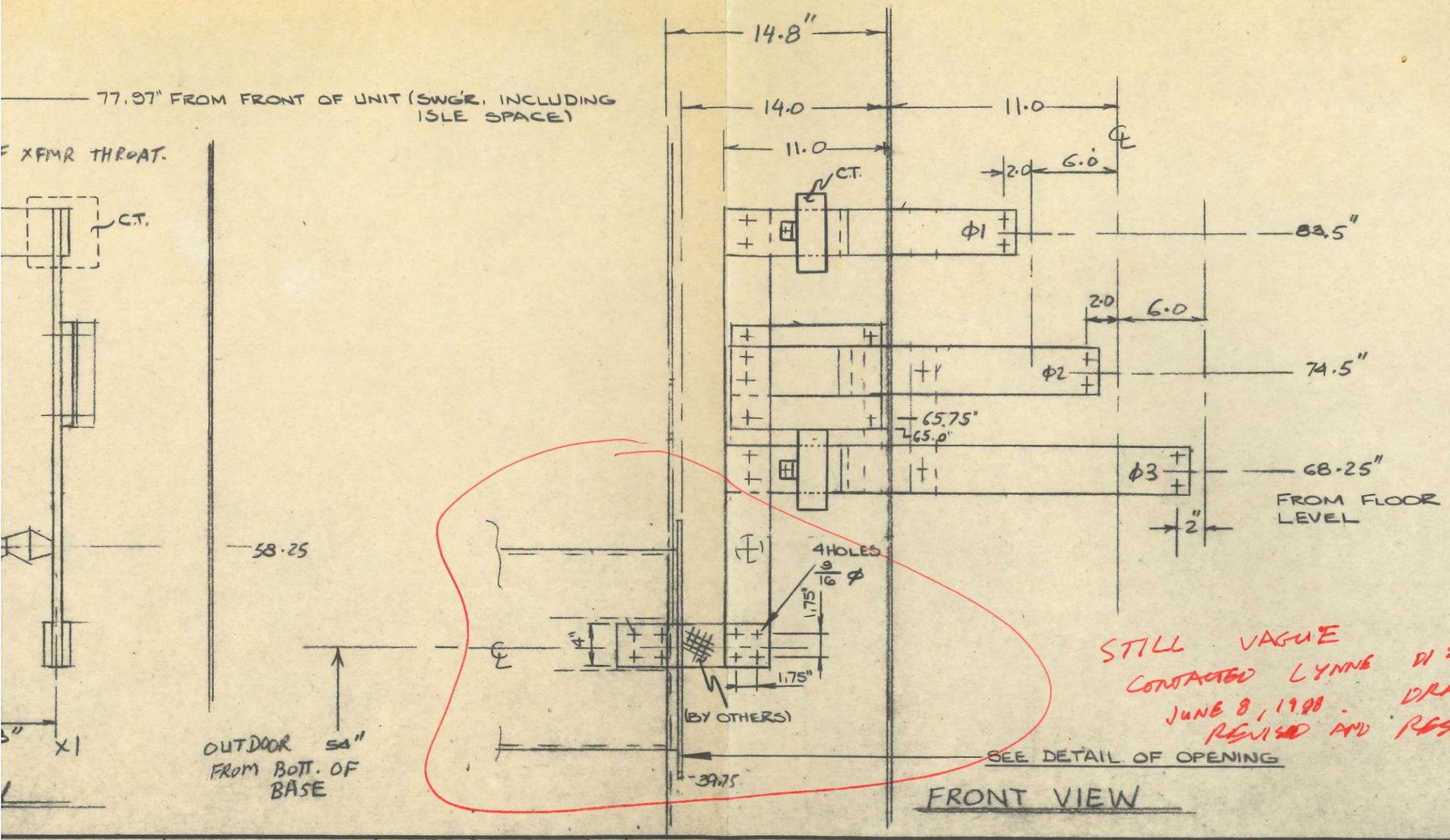


PLAN VIEW









STILL VAGUE
CONTACTED LYNNE DI SAVERIO
JUNE 8, 1998.
DRAWING WILL BE REVISED AND RESUBMITTED TO US

BUS BAR: 2 - 1.5" x 5" ALUMINUM

REVISION	DATE	BY		DATE	BY
01 FOR APPROVAL			DRAWN	4/22/98	M.S.
02 REV.	30-5-98	JS	CHEK'D		
			VERIF'D		

CUSTOMER: ONTARIO NORTHLAND

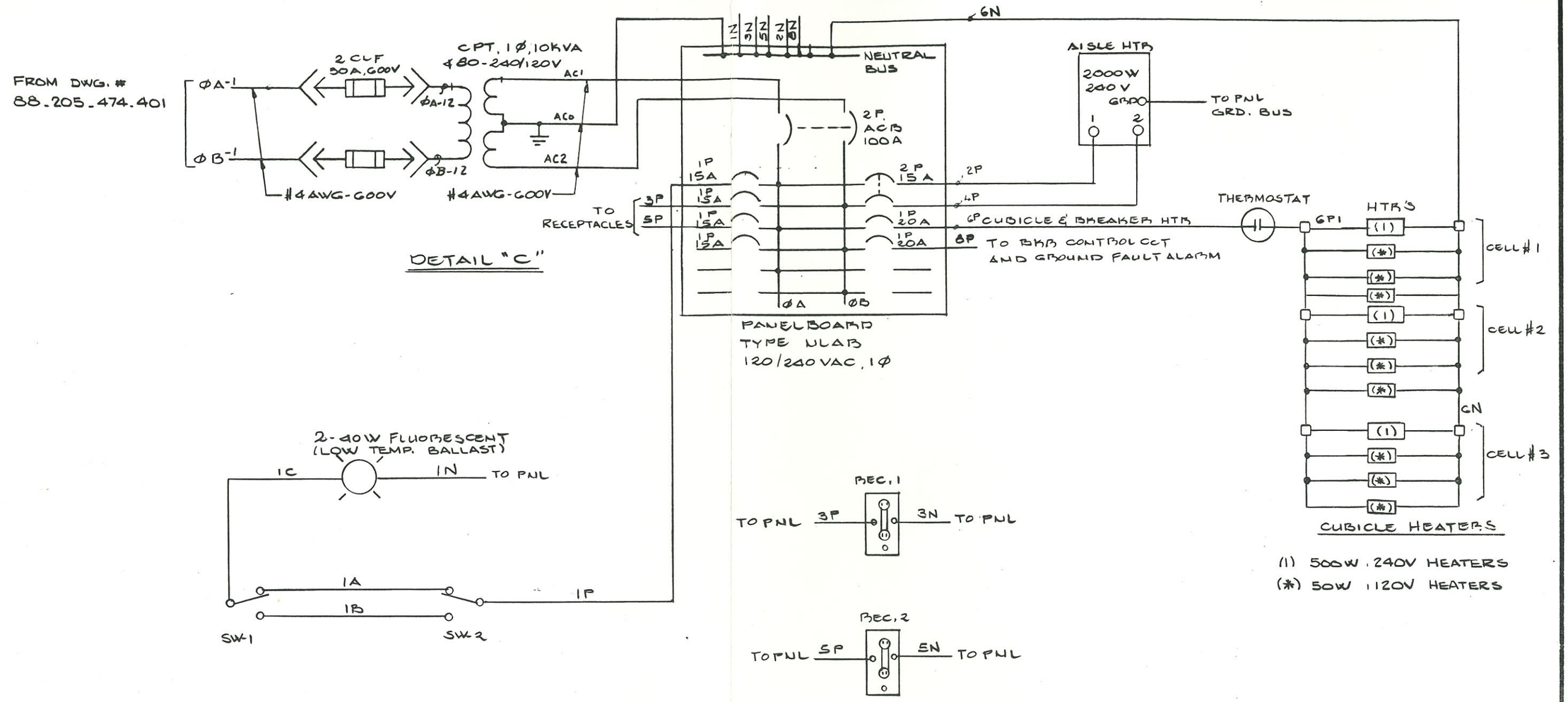
ORDER NO.

SIEMENS

TITLE: SR22 BUS CONN. TO XFMR L.H. 2500A AL.

REF.NO. A74-2242

DWG.NO. 88-304-53C-402 02



CUBICLE HEATERS

(1) 500W, 240V HEATERS
(*) 50W, 120V HEATERS

NOTE:

- WIRES FROM PANEL BOARD ARE #12 TBS
- CUBICLE HEATER WIRES #12 ASBESTOS

CERTIFIED AS BUILT

REVISION	DATE	BY		DATE	BY	CUSTOMER		TITLE 480V SWITCHGEAR OUTDOOR TYPE 'SR' WIRING DIAGRAM - MISCELLANEOUS EQUIP.	
01 FOR APPROVAL			DRAWN	4-20-88	STB	ONTARIO NORTHLAND	SIEMENS		
02 REV.	30-5-88	JS	CHEK'D					REF.NO. A74-2242 / W 2082	DWG.NO. 88-205-474-403 02
			VERIF'D	24/5/88	HK	ORDER NO.			

APPENDIX I - REFERENCE REPORTS

Please refer to the Reference Reports as outlined below, and which are attached to this Appendix I.

DOCUMENT	DATE
Maintenance Report provided by QUALUS Services Canada LTD.	December 20, 2025
Short Circuit, Protective Devices Coordination and Arc Flash Hazard Analysis provided by QUALUS Services Canada LTD.	December 31, 2025

QUALUS
SERVICES CANADA LTD.

MAINTENANCE REPORT

Ontario Northland Cochrane Site

Prepared for: Ontario Northland

200 Railway Street, Cochrane Ontario

Prepared by: Syed Asad Ali, EIT

Qualus Services Canada LTD.

Date: December 20, 2025

Job Reference: ENK-25-16358

Revisions: 0

1. Executive Summary

Qualus Services Canada Ltd. conducted maintenance testing and inspections on two pad-mount transformers, five pole-mount transformers, one overhead gang operated switch and seventeen utility poles located at 200 Railway Street, Cochrane, Ontario, on December 12, 2025.

The purpose of these tests and inspections was to assess the condition and functionality of the customer owned equipment and to verify its suitability for continued operation. All inspections and tests were performed in accordance with applicable maintenance standards and safety requirements.

This report presents a summary of the testing performed, the results obtained, and the findings identified during the inspection.

2. Scope of Work

HV Maintenance Testing & Inspection

- Five pole-mount transformers
  - Visual and mechanical inspection
  - Verify nameplate data
  - Thermal (infrared) scanning

- Overhead gang switch, fuse and pole
  - Visual and mechanical inspection
  - Phase & polarity verification
  - Contact resistance testing

- Two pad-mount transformers (500kVA & 2000kVA)
  - Visual and mechanical inspection
  - Insulation resistance testing
  - Winding resistance testing (as found tap only)
  - Turns ratio testing (as found tap only)
  - Oil sample & DGA testing

3. Findings & Recommendations

3.1 Findings

500kVA Transformer (Station Inn)

Overall, the condition of the 500 kVA (Station Inn) transformer appears acceptable. However, the measured percent difference in the secondary winding resistance was 2.018%. A secondary winding resistance deviation exceeding 2% is generally considered abnormal and requires further investigation. Such variation can result from test related factors, including ambient temperature differences, poor test connections, or an incorrect tap position. In this instance, the measurements were taken at an ambient temperature of −6 °C with 66% relative humidity. These conditions can contribute to uneven winding temperatures and increased contact resistance, potentially influencing the test results. Oil analysis results show that the transformer is in acceptable condition for continued use.

2000kVA Transformer (Wayside)

The 2000 kVA transformer is configured in a wye-to-delta arrangement, which is an uncommon configuration. The transformer was tested under adverse environmental conditions of approximately −7 °C with 68% relative humidity, which can decrease the insulation resistance values. The insulation resistance measured between the high to low voltage windings was 54.1 MΩ, while the resistance between the low voltage windings and ground was 623 MΩ. The variation in resistance values may have been influenced by multiple factors. One contributing factor is that the transformer primary side was not isolated during testing. Due to the extent of the corrosion at the primary terminations, isolating the transformer may have made reconnection impossible without full re-termination of the primary cables, creating additional operational and safety concerns. As a result, the primary cables remained connected to the wye side of the transformer, which may have introduced a parallel resistance path and contributed to the lower measured value of 54.1 MΩ between windings. Another possible factor is the condition of the grounding connection. During the low voltage windings to ground insulation resistance testing, corrosion on the ground conductor or a loose bond to the main grounding system may have affected the results and contributed to the observed resistance variation. Visual inspection identified significant mechanical deterioration. Including severe rusting of the high side bushing enclosure, excessive corrosion at the primary cable termination point, and active oil leakage from the H0 bushing.

All of which increase the likelihood of moisture ingress, reduced dielectric strength, and insulation degradation.

Furthermore, the secondary winding resistance test showed a percent difference of approximately 34.7% between phases, which is well outside acceptable limits and indicates a serious abnormality. This may have been caused by a loose or deteriorated secondary bus work, other internal connections or due to the corrosion and oxidization at the terminals of the test points. Oil test results did not indicate any internal fault or overheating condition which lessen the risk associated with this test results. Collectively, the electrical test results, environmental conditions during testing, and observed physical deterioration indicate a compromised transformer condition that requires further investigation and careful evaluation of continued serviceability.

Poles, Overhead Switch & Pole-mount Transformers

During the inspection, it was observed that many poles, pole-mounted transformers, and associated electrical equipment are in good condition. The single-phase transformers installed at Poles # P3, P12, and P16, along with the three single-phase transformers installed at Pole # P17, were also observed to be in good working condition. In addition, thermal (infrared) scanning was conducted on the pole-mounted transformers and associated electrical equipment, which confirmed that the equipment was operating within acceptable limits and in compliance with applicable standards. Refer to Appendix A for detail. No deficiencies were observed at Poles # P4, P5, P7, P11, or P14.

However, one of the two guy wires installed on Pole # P6 requires repair, and the central metering pole & main switch installed at Pole # P6A/B require the additional guy wire to provide adequate structural support. Poles # P8 & P9 similarly require additional guy wires on the track side alignment. In addition, the grounding mesh adjacent to the ONR-owned isolation switch installed at Pole # P10 was observed in poor condition and requires repair or replacement.

A comprehensive inspection summary listed in the Table 1 below and the associated equipment test data are provided in the Test Result section of this report.

3.2 Recommendations

500kVA Transformer (Station Inn)

The measured 2.018% difference in winding resistance for the 500 kVA transformer is not excessive and can be considered within a tolerable range. However, regular maintenance is recommended to ensure the ongoing condition of the transformer is not worsened. The transformer is suitable for service. Continue with routine maintenance and yearly oil sampling.

2000kVA Transformer (Wayside)

Considering the insulation resistance test results, oil leakage, severe corrosion of high side bushing encloser, and the significant percent difference in secondary winding resistance, the 2000 kVA transformer is in poor condition with an elevated risk of failure. In addition, the transparent covers of both the liquid temperature gauge and the pressure gauge are faded, limiting clear visibility, and replacement of these components should be considered to ensure proper monitoring and safe operation. Given the concerns mentioned above, the age of the transformer and the existing condition, we strongly recommend a full replacement of the transformer, along with new primary cable terminations. This would be the most reliable long-term solution and would eliminate the risks associated with insulation degradation, oil leakage, and compromised cable terminations.

Poles, Overhead Switch & Pole-mount Transformers

It is recommended that the damaged guy wire installed at Pole # P6 be repaired or replaced, and a new guy wire be installed at the central metering Pole # P6A/B. Additional guy wires should be installed at Pole # P8 and P9 toward the track side to improve structural stability. The grounding mesh located beside the ONR-owned isolation switch installed at Pole # P10 should be repaired or replaced to ensure safety and compliance. Refer to Figure 23 for detail. The three single-phase transformers, disconnect switches and surge arrestors installed at Pole # P2 are not currently in use and may be retained for future use if needed.

All remaining equipment is currently in good condition and routine maintenance is highly recommended to ensure the electrical equipment remains in good condition.

Scale House Pole Mounted Transformers

It is recommended that the three pole-mounted transformers at the scale house be replaced due to age and current physical condition. Refer to Figures 17-20 for detail.

Station Inn Basement Electrical Room

During inspection, it was observed that several transformers and panels had accumulated dirt and dust on and within the equipment, which could compromise cooling performance and reduce overall equipment lifespan. It is recommended that routine maintenance be performed to mitigate these concerns.

Wayside Switchgear Siemens RL Breakers

Following the shutdown, two Siemens breakers failed to close during the re-energization of the Wayside Transformer and required additional troubleshooting before successful operation. The Siemens breakers were last maintained in 2021 (ENK-21-9483) and were deemed to be in good condition for continued service at that time. However, these Siemens RL breakers are now obsolete, and it is recommended that the breakers be upgraded in the near future to maintain system reliability and avoid any nuisance service disruptions.

Until such upgrades are implemented, it is recommended that all six breakers be placed under a routine maintenance program. In addition, complete and functional charging handle assemblies should be provided for this switchboard, as some components were observed to be missing or incomplete, limiting proper operation.

4.3 2000kVA Transformer Inspection

TRANSFORMER INSPECTION

CUSTOMER	Ontario Northland Railway	PAGE	
ADDRESS	326 2nd St; Cochrane Canada	DATE	2025-12-12
OWNER	Ontario Northland Railway; 200 Railway St; Cochrane ON Canada	JOB #	ENK-25-16358
SITE	Cochrane	TEST STATUS	
SUBSTATION	Wayside	ASSET ID	
EQUIPMENT	2000 kVA Transformer	AMIBIENT TEMPERATURE	-7 °C
		HUMIDITY	68 %

NAMEPLATE DATA

MFR	Northern Transformer	CLASS	ONAN	PHASES	3
SER NO	87-344	COOLANT	OIL	REASON	Routine
YEAR	1987	TANK TYPE	SEALED	WEIGHT	6160 kg
				WINDING MATERIAL	Cu
				OIL VOLUME	1,280 kg
				OIL TEMP	0 °C
				IMPEDANCE	6 %
				WEATHER	Sunny
				BIL	125/30 kV

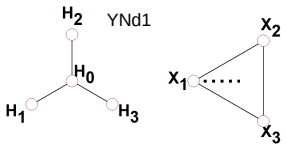


Diagram # 9 (ANSI)

	VOLTAGE (kV)		kVA	RATED I	# TAPS	NOMINAL	CHANGER	TAP SETTING
	L-L	L-G						
PRIMARY:	24,940	14,399.1	2,000	0.05	5	3	DETC	2
SECOND:	480		2,000	2.41	1			

COMMENTS:

GAUGES:

COOLANT TEMPERATURE	0 °C	MAXIMUM COOLANT TEMPERATURE	50 °C	RESET TEMPERATURE GAUGES	☐
COOLANT LEVEL	Acceptable	PRESSURE VACUUM	#	LCR COUNTER	
OTHER GAUGES	N/A				

VISUAL INSPECTION:

BUSHINGS	Poor	SUPPORT INSULATORS	N/A	CONNECTIONS	Poor
PAINT	Faded	RADIATORS	Acceptable	FANS	N/A
NO-LOAD TAP CHANGER	Acceptable	LEAKS	Yes. Please refer to the report for detail.		

FAN PUMP CONTROLS: N/A

ADDITIONAL EQUIPMENT: Significant rusting on the primary bushing enclosure. Please refer to the report for detail.

GROUND CONDUCTOR SIZE: 2/0 AWG/KCM NO. OF GROUND CONDUCTORS: GROUND CONDUCTOR CONDITION: or

TEST EQUIPMENT USED: N/A TESTED BY: PW/SAA

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4.4 2000kVA 3Ø Winding Resistance and Turns Ratio

3Ø Winding Resistance and Turns Ratio

CUSTOMER	Ontario Northland Railway	PAGE	
ADDRESS	326 2nd St; Cochrane Canada	DATE	2025-12-12
OWNER	Ontario Northland Railway; 200 Railway St; Cochrane ON Canada	JOB #	ENK-25-16358
SITE	Cochrane	TEST STATUS	
SUBSTATION	Wayside	ASSET ID	
EQUIPMENT	2000 kVA Transformer	AMIBIENT TEMPERATURE	-7 °C
		HUMIDITY	68 %

Nameplate

MFR	Northern Transformer	WEIGHT	6,160 kg	OIL VOLUME	1,280 kg
SER NO	87-344	CLASS	ONAN	COOLANT	OIL
YEAR	1987	BIL	125/30 kV	IMPEDANCE	6 %
TYPE	SEALED				

YNd1

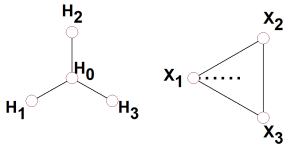


Diagram # 9 (ANSI)

	Voltage (V)		kVA	Rated I	# Taps	Nominal	Tap Changer	Tap Setting	First Tap Voltage	Last Tap Voltage	© Material
	L-L	L-G									
Primary	24,940	14,399	2,000	46.30	5	3	DETC	2	26,187	23,693	Cu
Secondary	480		2,000	2,405.63	1				480	480	Cu

Transformer Test Conditions

AMBIENT TEMP.	-7 °C	OIL TEMP	0 °C	REASON	Routine
HUMIDITY	68 %	WINDING TEMP	°C	TEST STATUS	
WEATHER	Sunny				

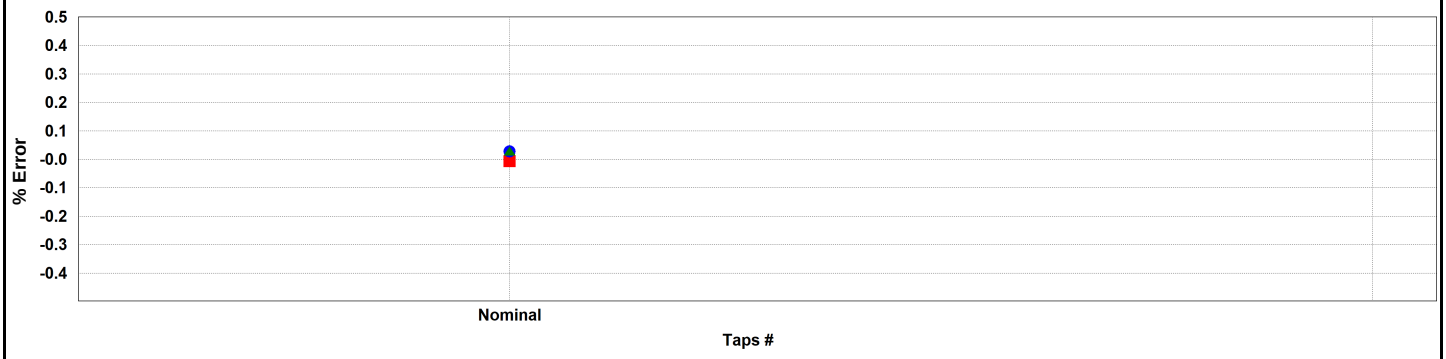
Turns Ratio - Primary(2) to Secondary Taps

Tap Pri/Sec		Voltage Pri/Sec		Test V	Calc TTR	$H_1 - H_0 / X_1 - X_2$ Actual TTR	% Error	I exc mA	Phase (Deg)	$H_2 - H_0 / X_2 - X_3$ Actual TTR	% Error	I exc mA	Phase (Deg)	$H_3 - H_0 / X_3 - X_1$ Actual TTR	% Error	I exc mA	Phase (Deg)
2	Nominal	25,564	480	0	30.749	30.747	-0.01	1.8	-0.056	30.757	0.03	1.4	-0.053	30.757	0.03	1.8	-0.054

TEST EQUIPMENT USED: Megger MWA & Megger MIT515 TESTED BY: PW/SAA

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Turns Ratio - Primary(2) to Secondary Taps



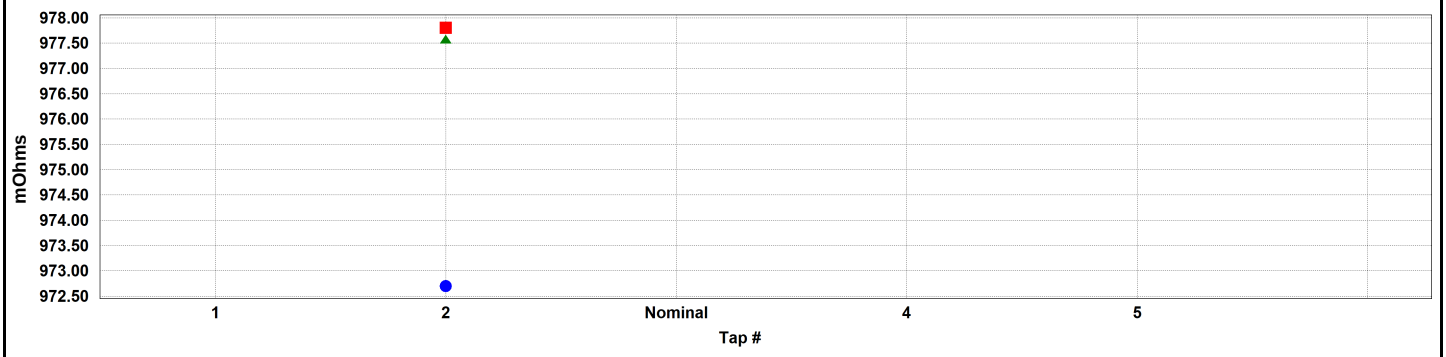
$H_1 - H_0 / X_1 - X_2$ $H_2 - H_0 / X_2 - X_3$ $H_3 - H_0 / X_3 - X_1$

Resistance - Primary

Test Current (A) / Stability (%/Digit) — Measured Resistance — Units: mΩ

Tap	$H_1 - H_0$		$H_2 - H_0$		$H_3 - H_0$		Winding Diff Max: 2 %
1							
2	5.1242 / 99.991	977.8	5.1257 / 99.999	**972.7**	5.1271 / 99.998	**977.6**	0.523
Nominal							
4							
5							

Resistance - Primary



$H_1 - H_0$ $H_2 - H_0$ $H_3 - H_0$

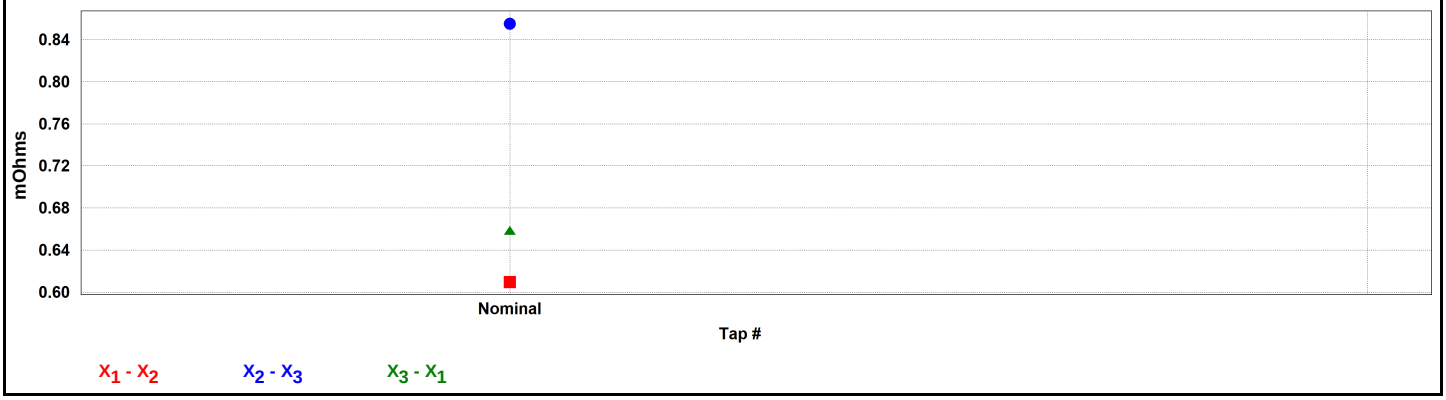
Resistance - Secondary

Test Current (A) / Stability (%/Digit) — Measured Resistance — Units: mΩ

Tap	$X_1 - X_2$		$X_2 - X_3$		$X_3 - X_1$		Winding Diff Max: 2 %
Nominal	10.1166 / 99.869	0.609	10.1167 / 99.720	**0.855**	10.1108 / 99.637	**0.659**	34.706

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Resistance - Secondary



COMMENTS:	Insulation Resistance Test Results: H-L: 54.1 Mega Ohms L-G: 623 Mega Ohms Unable to remove H0 connection. Please refer to the report for detail.
DEFICIENCIES:	13,3 Failed

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4.6 AVO Diagnostics Oil Results – 2000 kVA

AVO DIAGNOSTIC SERVICES
919 FRASER DR. UNIT 13 + BURLINGTON, ON + L7L 4X8
905 632 8697 + 905 632 7476
WWW.AVODIAGNOSTICS.COM

TEST REPORT
01-7908192-764156-00

Qualus Services Canada Ltd.

BOLTON, ON L7E 1G1 CA
ATTN: DEB HITCHINS
PO#: ENK-25-16394
Project ID:
Customer ID:

Serial#: 87344
Location: WAYSIDE
Equipment: TRANSFORMER
Compartment: MAIN(BOTTOM)
Breathing: SEAL
Bank: **Phase:** 3
Fluid: MIN **Liters:** 1490

Mfr: NORTHERN
kV: 25
kVA: 2000
Year Mf'd: 1987
Syringe ID: 6003219
Bottle ID: 87-344
Sampled By:

Control#: 7908192
Order#: 764156
Account: 108040
Received: 11/24/2025
Reported: 11/26/2025

	Lab Control Number:	7908192	7261796	6947960
	Date Sampled:	11/12/2025	07/25/2019	08/29/2016
	Order Number:	764156	599072	519156
	Oil Temp:	12	41	36
Dissolved Gas Analysis (DGA)	**O2/N2 Ratio:**	0.46	0.45	0.42
ASTM	**Transformer Age (yrs):**	38	32	29
D-3612[1]	**Hydrogen (H2) (µL/L):**	<2	3	5
	Methane (CH4) (µL/L):	6	6	7
	Ethane (C2H6) (µL/L):	10	10	9
	Ethylene (C2H4) (µL/L):	5	3	4
	Acetylene (C2H2) (µL/L):	<1	<1	<1
	Carbon Monoxide (CO) (µL/L):	175	193	196
	Carbon Dioxide (CO2) (µL/L):	2697	2854	2558
	Nitrogen (N2) (µL/L):	57348	66342	67954
	Oxygen (O2) (µL/L):	26203	29678	28865

Dissolved Gas Analysis Diagnostics – IEEE Std C57.104-2019

	Absolute Gas Levels (µL/L)		**Gas Level Deltas(µL/L) (2 most recent samples)**		**Gas Generation Rates (µL/L per yr) (3-6 most recent samples within 4-24 mos.)**	
Gas	**Level**	**Diagnostic**	**Delta**	**Diagnostic**	**Rate**	**Diagnostic**
Hydrogen (H2)	<2	Normal (<= 40)	-1			
Methane (CH4)	6	Normal (<= 20)	0	Normal Variation (<= 10)		
Ethane (C2H6)	10	Normal (<= 15)	0	Normal Variation (<= 7)		
Ethylene (C2H4)	5	Normal (<= 60)	2	Normal Variation (<= 20)		
Acetylene (C2H2)	<1	Normal (<= 2)	0	Normal Variation (<= 0)		
Carbon Monoxide (CO)	175	Normal (<= 500)	-18			
Carbon Dioxide (CO2)	2697	Normal (<= 5500)	-157			

DGA Diagnostics **Roger's Ratio**	Diagnostic not applicable - Gas levels normal.
Duval Triangles	Diagnostic not applicable – Triangle 1 gas levels normal. Diagnostic not applicable – Triangle 4 gas levels normal. Diagnostic not applicable – Triangle 5 gas levels normal.
Duval Pentagons	Diagnostic not applicable - Gas levels normal.
Cellulose insulation	CO and CO2 levels are normal. No indication of a fault involving paper.
DGA Status	Status 1 - Normal gas levels and no Indication of gassing. Continue routine DGA and normal transformer operation.
Resampling Protocol	Routine Screening
AVO Resampling Recommendation	Resample within 1 year.
Comment:	
General Oil Quality (GOQ)	

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Color Number testing completed by equivalent digital (ASTM D6045) and/or manual (ASTM D1500) methodologies. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

Accreditation applies to current analysis only. The analyses, opinions or interpretations contained in this report are based upon material and information supplied by the client. AVO Diagnostic Services does not imply that the contents of the sample received by this laboratory are the same as all such material in the environment from which the sample was taken. Our test results relate only to the sample or samples tested. Any interpretations or opinions expressed represent the best judgment of AVO Diagnostic Services. AVO Diagnostic Services assumes no responsibility and makes no warranty or representation, expressed or implied as to the condition, productivity or proper operation of any equipment or other property for which this report may be used or relied upon for any reason whatsoever. This test report shall not be reproduced except in full, without written approval of the laboratory.

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TEST REPORT
01-7908192-764156-00

Qualus Services Canada Ltd.
BOLTON, ON L7E 1G1 CA
ATTN: DEB HITCHINS
PO#: ENK-25-16394
Project ID:
Customer ID:

Serial#: 87344 **Location:** WAYSIDE **Equipment:** TRANSFORMER **Compartment:** MAIN(BOTTOM) **Breathing:** SEAL **Bank:** **Phase:** 3 **Fluid:** MIN **Liters:** 1490

Mfr: NORTHERN **kV:** 44 **kVA:** 2000 **Year Mf'd:** 1987 **Syringe ID:** 6003219 **Bottle ID:** 87-344 **Sampled By:**

Control#: 7908192 **Order#:** 764156 **Account:** 108040 **Received:** 11/24/2025 **Reported:** 11/26/2025

		Lab Control Number:	7908192	7261796	6947960
		Date Sampled:	11/12/2025	07/25/2019	08/29/2016
		Order Number:	764156	599072	519156
		Oil Temp:	12	41	36
ASTM D-1533[1]	**Moisture in Oil**	**(mg/kg):**	4	4	6
ASTM D-971[1]	**Interfacial Tension**	**(mN/m):**	40.16	40.81	41.18
ASTM D-974[1]	**Acid Number**	**(mg KOH/g):**	< 0.01	0.009	0.016
ASTM D-1500[1, 3]	**Color Number**	**(ASTM):**	L0.5	L0.5	L0.5
ASTM D-1524[1]	**Visual Exam.**	**(Relative):**	PASS	PASS	PASS
			CLR&BRIGHT	CLR&BRIGHT	CLR&BRIGHT
ASTM D-1524[1]	**Sediment Exam.**	**(Relative):**	ND	TRACE	ND
ASTM D-877	**Dielectric Breakdown**	**(kV):**		52	40
ASTM D-1816[1]	**Dielectric Breakdown 2 mm**	**(kV °C):**	49 (22°C)		
ASTM D-924	**Power Factor @ 25°C (Routine)**	**(%):**		0.010	0.007
ASTM D-4052[1]	**Density @15°C**	**(g/mL):**	0.858	0.8586	0.8597

GOQ Diagnostics
PER IEEE C57.106-2015
(most recent sample)

Moisture in Oil:	Acceptable for in-service oil (35 mg/kg max).
Interfacial Tension:	Acceptable for in-service oil (25 mN/m min).
Acid Number:	Acceptable for in-service oil (0.2 mg KOH/g max).
Color Number and Visual:	Diagnostic not applicable. Diagnostic not applicable.
Dielectric Breakdown ASTM D-1816:	Acceptable for in-service oil (40 kV min @ 2mm).

Comment:

End of Test Report

Authorized By:

JEAN-PIERRE EL-KHOURY-MERHEB
REGIONAL MANAGER

Notations: 1. Analysis is ISO/IEC 17025:2017 accredited, ANAB Accredited Certificate Number L2303 2. This test is conducted by a subcontracted laboratory. 3. Color Number testing completed by equivalent digital (ASTM D6045) and/or manual (ASTM D1500) methodologies. 5. This test is conducted by AVO Diagnostic Services Laboratory other than Primary Lab. 6. AVO Diagnostic Services Laboratory has received ISO Standard 17025 accreditation for this test. 7. Imported Sample: AVO Diagnostic Services accepts no responsibility for these results; accreditation status does not apply to these results. 8. Imported Equipment 10. mg/kg , µg/g, µg/mL, µL/L = ppm, µg/L = ppb, mN/m = dynes/cm, mm²/s = cSt

Accreditation applies to current analysis only. The analyses, opinions or interpretations contained in this report are based upon material and information supplied by the client. AVO Diagnostic Services does not imply that the contents of the sample received by this laboratory are the same as all such material in the environment from which the sample was taken. Our test results relate only to the sample or samples tested. Any interpretations or opinions expressed represent the best judgment of AVO Diagnostic Services. AVO Diagnostic Services assumes no responsibility and makes no warranty or representation, expressed or implied as to the condition, productivity or proper operation of any equipment or other property for which this report may be used or relied upon for any reason whatsoever. This test report shall not be reproduced except in full, without written approval of the laboratory.

5. References

- NETA MTS 2023: Standards for Acceptance Testing Specifications for Electrical Power equipment and Systems, 2023.
- Scopes of Work for Electrical Acceptance Testing, Document Number: 1910DB1302, March 2013, Schneider Electric USA, Inc.
- IEEE 399-1997: Recommended Practice for Industrial and Commercial Power Systems Analysis (Brown Book)
- IEEE 141: Recommended Practice for Electric Power Distribution for Industrial Plants (Red Book)
- IEEE 242-2001: Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems (Buff Book)
- CSA-Z462-24: Canadian Standards Association
- CSA-22.1-24: Canadian Standards Association, Canadian Electrical Code, Part I
- CSA-CAN3-235: Canadian Standards Association, Preferred Voltage Levels for AC Systems, 0 to 50,000 V
- Ontario Electrical Safety Code (OESC) - 2024

6. Revision History

Revision #	Date	Author	Comments
0	December 20, 2025	SAA	Initial Release



Figure 6: 2000kVA Transformer (Wayside) - Nameplate Information



Figure 7: 2000kVA Transformer (Wayside) - Oil Level Indicator & Pressure Gage



Figure 8: 2000kVA Transformer (Wayside) - Oil Temperature Gage



Figure 9: 2000kVA Transformer (Wayside) - Primary Cables & Bushing Condition



Figure 10: 2000kVA Transformer (Wayside) - Primary Cable Inlet & Encloser Condition



Figure 11: 2000kVA Transformer (Wayside) - H1 Bushing & Cable Termination Condition



Figure 12: 2000kVA Transformer (Wayside) - H2 Bushing & Cable Termination Condition



Figure 13: 2000kVA Transformer (Wayside) - H3 Bushing & Cable Termination Condition



Figure 14: 2000kVA Transformer (Wayside) - H0 Bushing & Active Oil Leakage



Figure 15: 2000kVA Transformer (Wayside) - Primary Busing Encloser Condition



Figure 16: 2000kVA Transformer (Wayside) - Primary Busing Encloser Condition

Appendix A

Thermal (Infrared) Scanning Report

Measurements

Sp1	1.1 °C

Parameters

Emissivity	0.95
Refl. temp.	20 °C

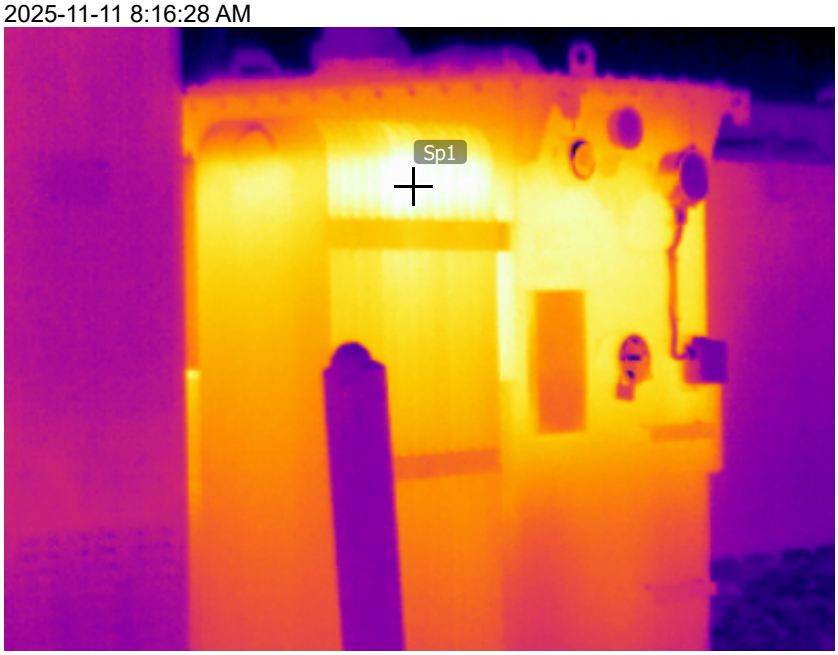
Geolocation

Compass	232° SW

Note

Wayside Track Transformer.

2025-11-11 8:16:28 AM



FLIR3685.jpg FLIR T420 (incl Wi- 62107096

2025-11-11 8:16:28 AM



FLIR3685.jpg FLIR T420 (incl Wi- 62107096

ABOUT QUALUS

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Short Circuit, Protective Devices Coordination and Arc Flash Hazard Analysis

Ontario Northland Cochrane Study

Job Number: ENK-25-16394
Date: December 31, 2025

ECRA/ESA #7008369
4 Holland Dr. Unit #8, Bolton, Ontario L7E 1G1

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Bolton, ON, L7E 1G1
289-616-0400

Power System Study

Short Circuit, Protective Devices Coordination and Arc Flash Hazard Analysis

Prepared for

Ontario Northland Cochrane Study

Cochrane, ON

Prepared by: Kim Chigbo
Reviewed by: Abdulrahman Al-Khulaqi, P.Eng
Date: December 31, 2025
Job Reference: ENK-25-16394
Job Title: Ontario Northland Cochrane Study
Revisions: 0

Disclaimer

The following study was prepared utilizing industry-accepted standards and methodology. Data used in this analysis was gathered through equipment nameplate, manufacturer ratings, or published information. Modification of equipment, changes to system configuration, adjustment of protective device settings, failure to properly install equipment in accordance with manufacturer's recommendations or electrical code requirements, or failure to properly maintain equipment may invalidate the study results. The study is intended for use by qualified individuals. Any copies or distribution of this report without written consent from Qualus Services Canada Ltd. is strictly prohibited. Qualus Services Canada Ltd. accepts no liability should this report or any information herein be used by any party for any purpose other than information.

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1 Summary

1.1 Introduction

This report contains the results of the Short Circuit, Protective Devices Coordination and Arc Flash Hazard Analysis performed for the electrical power distribution system of Ontario Northland Cochrane Study located at:

- Cochrane Freight Building (100 Third Avenue, Cochrane, Ontario)
- Cochrane Shops – Includes Wayside Power Enclosure, Cochrane Coach Shop, Powerhouse, Fueling Facility, Wheel Drop Pit Shelter & Main Shops (Diesel & Stores) (326 Second Street, Cochrane, Ontario)
- Cochrane Station Inn (200 Railway Street, Cochrane, Ontario)
- Cochrane Trainman's Bunkhouse (147 Second Street, Cochrane, Ontario)
- Cochrane Yard Office (20 Boisvert Crescent, Cochrane, Ontario)

All analysis was performed using the "Power Tools for Windows" software, Version 11.0.0.1, developed by SKM System Analysis, Inc.

Changes in the electrical distribution system within the facility or in the utility system could affect the results of this power system analysis. As such, the analysis is required to be reviewed periodically, not to exceed 5 (five) years, as stipulated in the CSA Z462-2024 [1].

1.2 Scope of Work

The Short Circuit, Protective Devices Coordination and Arc Flash Hazard Analysis included the following devices:

- 25000V - 480/277V Main Transformer
- 25000V - 120/240V Main Transformer
- 24900V - 347/600V Main Transformer
- 24900V - 120/208V Main Transformer
- 600V/208V Main Fuses
- 600V/480V/240V Main Breakers
- 480V Main Distribution Switchboard
- 600V/480V/240V/208V Distribution Panels
- 600V - 120/208V Distribution Transformer
- 480V - 120/240V Distribution Transformer
- 480V - 120/208V Distribution Transformer
- 600V/480V/208V Motor Pumps

2 System Model & Input Data

2.1 Study Input Data Sources

The electrical power distribution system considered in the study was modeled as represented by single-line diagrams provided in Section 2.5 - System Model & Input Data.

The study was based on the following technical information and documents:

1) The Single-line diagram drawings:
   a) Based on site personnel walk-through conducted by Qualus Services Canada in November 2025.
   b) Single line diagram provided by Eaton Industries (Canada) Company, Reference: Drawing Titles: Model - Cochrane Freight, Cochrane Station Inn, Cochrane Trainman's Bunkhouse, Cochrane Yard Office, and Cochrane Shops Last Modified Date: 27/02/2024.
   c) Based on previous EATON study, "CQSISD23J0173.1", SHORT CIRCUIT, PROTECTIVE DEVICE COORDINATION, AND ARC FLASH INCIDENT ENERGY ANALYSIS FOR ONTARIO NORTHLAND TRANSPORTATION COMMISSION COCHRANE AND TIMMINS, ONTARIO, dated 27/02/2024.
   d) Based on previous Enkompass study, "ENK-18-3433", Ontario Northland Railway, revision 0, dated 06/01/2019.
2) The conductor types and sizes - as per data collected by Qualus representative on site and reference from EATON study.
3) The conductor lengths - as per data collected by Qualus representative on site and reference from EATON study.
4) The power transformer information - as per the data provided by site personnel walk-through and Northern Ontario Wires.
5) The utility contributions to the short-circuit fault currents - as per the data provided by Northern Ontario Wires.

2.2 Input Data Deficiencies and Assumptions

The following table outlines the data deficiencies that could not be resolved for the analysis.

Table 2.1: Data Deficiencies

Device Name	Description of Data Deficiency	Action Taken in Arc Flash Study
CBL-SEACAN TRANSFORMER CBL-PANEL J CBL-TX-PANEL J CBL-COMPRESSOR CBL-LIFT DEVICE CBL-MOTOR #2 CBL-DISC-SUMP PUMP 1/2	Cable lengths could not be traced on site.	Estimated cable lengths were made based on location of source and feeder buses.
CBL-SEACAN TRANSFORMER CBL-PANEL J CBL-TX-PANEL J CBL-LIFT DEVICE CBL-MOTOR #2 CBL-DISC-SUMP PUMP 1/2 CBL-TRACK1 WAYSIDE	Cable sizes could not be confirmed on site.	Estimated cable sizes based on the line side overcurrent protective device rating/pickup setting. It was assumed that the cable was installed in compliance with OESC Rule 14-104.
FU-TX-75kVA CB-MAIN LP I CB-MAIN LP E FU-OUTSIDE RIP PIT HEATERS # 1 FU-OUTSIDE RIP PIT HEATERS # 2	Manufacturer's protective device model and trip documentation could not be obtained.	Protective devices were not considered in the short circuit, coordination & arc flash analysis. No assessment on the adequacy of the device interrupting ratings or overcurrent ratings with respect to the OESC was conducted for these devices.
TX-PANEL J	Transformer impedance could not be obtained from equipment during site inspection.	Transformer sizing and impedance were estimated based on typical transformer calculations and values.
MTR-HR	Motor nameplate data could not be confirmed.	Motor size was estimated based on the known conductor and overcurrent protective device sizes. It was assumed the motor was installed in compliance with OESC Rule 28-106 & 28-200.

2.3 Code Violations

The results of the protective device coordination analysis found some potentially significant deficiencies that may have to be resolved to achieve compliance with the current versions of applicable Codes and Standards.

Table 2.2: Code Violations

Affected Device	Affected Rule	Deficiency Description	Recommendation to Comply
CB-TRANSFORMER XFER SWITCH	26-256	The overcurrent protective device, protecting the transformer is rated at 222% of the transformer's primary FLA.	Replace the circuit breaker, with one that is rated not more than 125% of the Transformer FLA(112.7A) OR the next standard breaker size not exceeding 125A
CBL-BUNKHOUSE WAYSIDE	14-104	640A breaker feeding CBL-BUNKHOUSE WAYSIDE (2R (#300 KCMIL) (570A)).	Adjust the long-time pickup to 0.75(600A) of the breaker (CB-BUNKHOUSE WAYSIDE) OR Change the conductor installation so that it is greater than or equal to the breaker ampacity setting (640A). Note: Adjusting the breaker is only recommended after validating the circuit ampacity requirements.
CB-COACH SHOP SWBD	14-104	400A breaker feeding CBL-MAIN COACH SHOP SWBD (1R (#250 MCM) (255A)).	Replace the circuit breaker (CB-COACH SHOP SWBD) to less than or equal to the conductor allowable ampacity (255A). A 300A breaker is acceptable under CEC Table 13 OR Change the conductor installation so that it is greater than or equal to the breaker ampacity setting (400A). Note: Replacing the breaker is only recommended after validating the circuit ampacity requirements.

Affected Device	Affected Rule	Deficiency Description	Recommendation to Comply
CB-TS-3-N	14-104	400A breaker feeding CBL-T-3 SPL (2R (#2/0 AWG) (350A)).	Replace the circuit breaker (CB-TS-3-N) to less than or equal to the conductor allowable ampacity (350A) OR Change the conductor installation so that it is greater than or equal to the breaker ampacity setting (400A). Note: Replacing the breaker is only recommended after validating the circuit ampacity requirements.
CBL-TX-Y CBL-PANEL LPY	14-104, 26-256	60A breaker feeding CBL-TX-Y(1R (#8 AWG) (50A)) and downstream of the transformer CBL-PANEL LPY (1R (#2 AWG) (115A)). Cable CBL-TX-Y fed to a 45 kVA transformer at 480V (54 FLA) and cable CBL-PANEL LPY fed from the transformer at 208V (125 FLA).	Replace the 60A circuit breaker (CB-TX-Y) with a 45A circuit breaker to protect both the primary and secondary cables. Note: This solution may cause nuisance tripping of the transformer, as the transformer may experience inrush current. If this occurs, the cables may need to be upgraded to appropriately sized conductors.
FU-TRACK #4 WE	28-200	The 20A overcurrent protective device feeding the motor branch is rated at more than 400% of the motor's FLA.	Replace the protective device with one that is less than or equal to 400% of the motor's FLA. Note: Replace with the next acceptable breaker sizing (15A).
CBL-LP-F/G SPL CBL-LP G CBL-LP F	26-256	1R (#3/0 AWG) (200A) cables fed from a 75 kVA transformer at 208V (208 FLA).	Cables must have ampacities greater than or equal to 125% of the secondary transformer FLA (260A) OR Transformer primary breaker must have a rating less than or equal to the installed cable ampacities (69.33A).

Affected Device	Affected Rule	Deficiency Description	Recommendation to Comply
CBL-TX-HOTEL TRANSFORMER	26-256	1R (#2 AWG) (115A) cable fed to a 112.5 kVA transformer at 600V (108 FLA).	Cable must have ampacity greater than or equal to 125% of the transformer FLA (135A) OR Transformer primary fuse must have a rating less than or equal to the installed cable ampacity (115A). The Transformer primary fuse is 125A, so an LV copper conduit cable #1 AWG is acceptable.
CBL-TX-75kVA	14-100	The TX-75kVA branch circuit does not have an overcurrent device installed to protect the cable from overload and short circuit damage.	Install a new protective device rated less than or equal to 85A on the supply side of CBL-TX-75kVA.

Note: The possible deficiencies listed in the above table were assessed based on the current version of the OESC [2]. An assessment of the original system construction and equipment installation relative to the applicable codes and standards at the time of construction is not included in this analysis. We recommend further investigation to determine the appropriate courses of action to address each of the possible overcurrent protection deficiencies observed.

Note: The proposed breaker ampacity adjustments in the above table are provided under the assumption that the circuit ampacity of the installed conductors, transformers, and/or motors match the system design ampacity. We recommend validating the required circuit ampacities based on the connected loads and electrical system design requirements. Once the circuit ampacities are validated, we recommend revising this arc flash study to reflect the correct circuit ampacities.

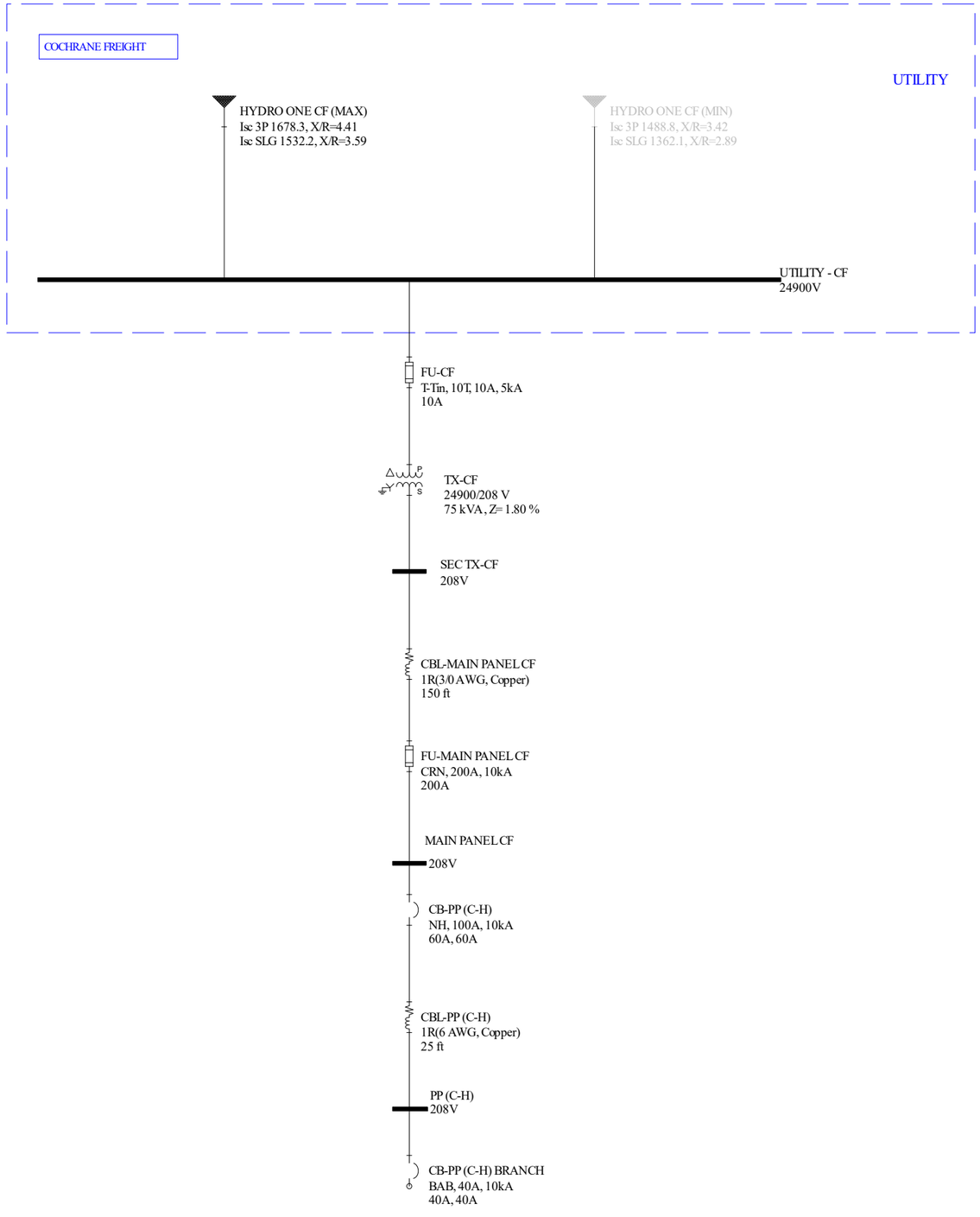
2.4 General Comments

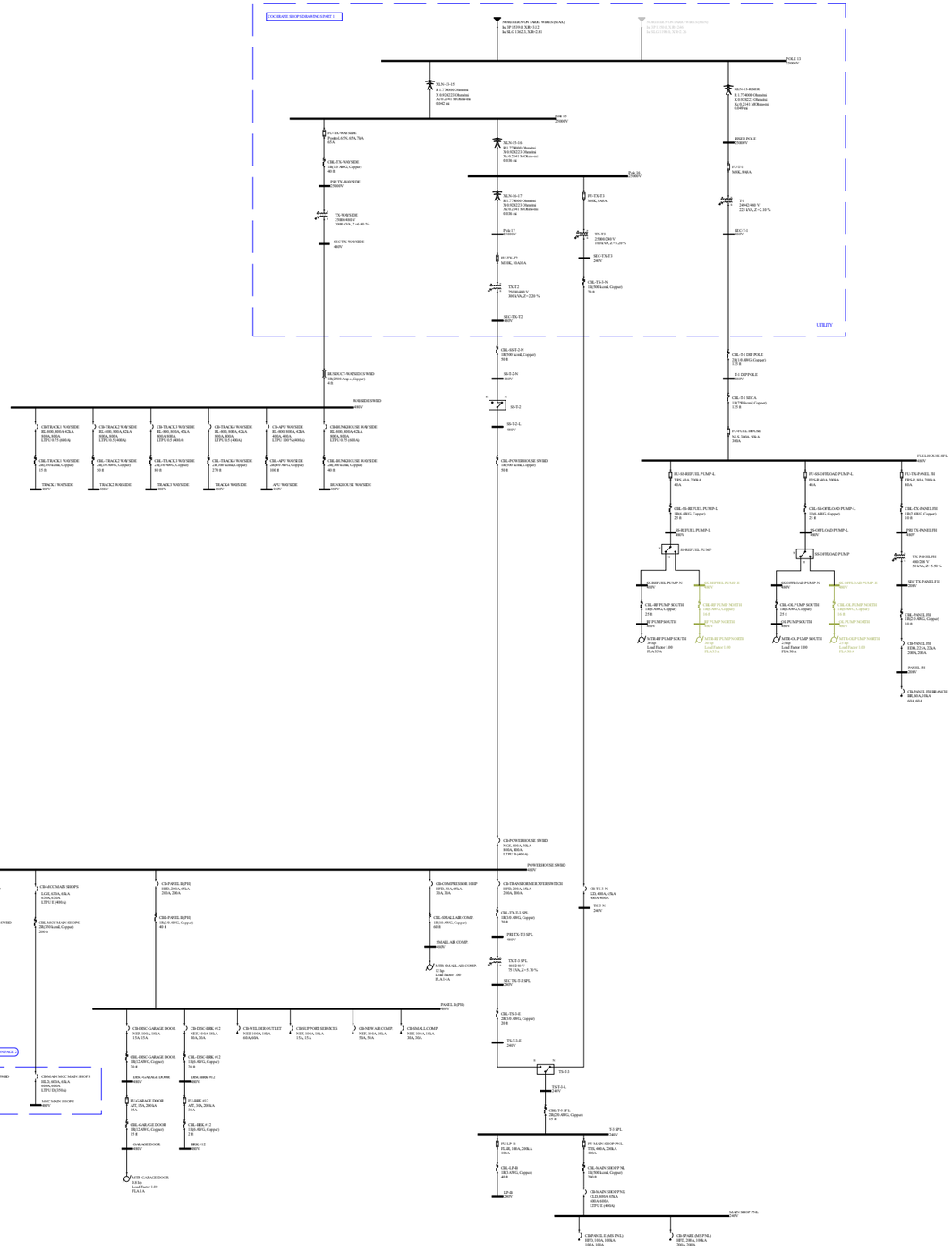
It is best practice to install multiple pole fused disconnects with the same size, manufacturer, and model of fuses in each pole. We recommend replacing the installed fuses such that each pole of each fused disconnect have the same size, manufacturer, and model characteristics.

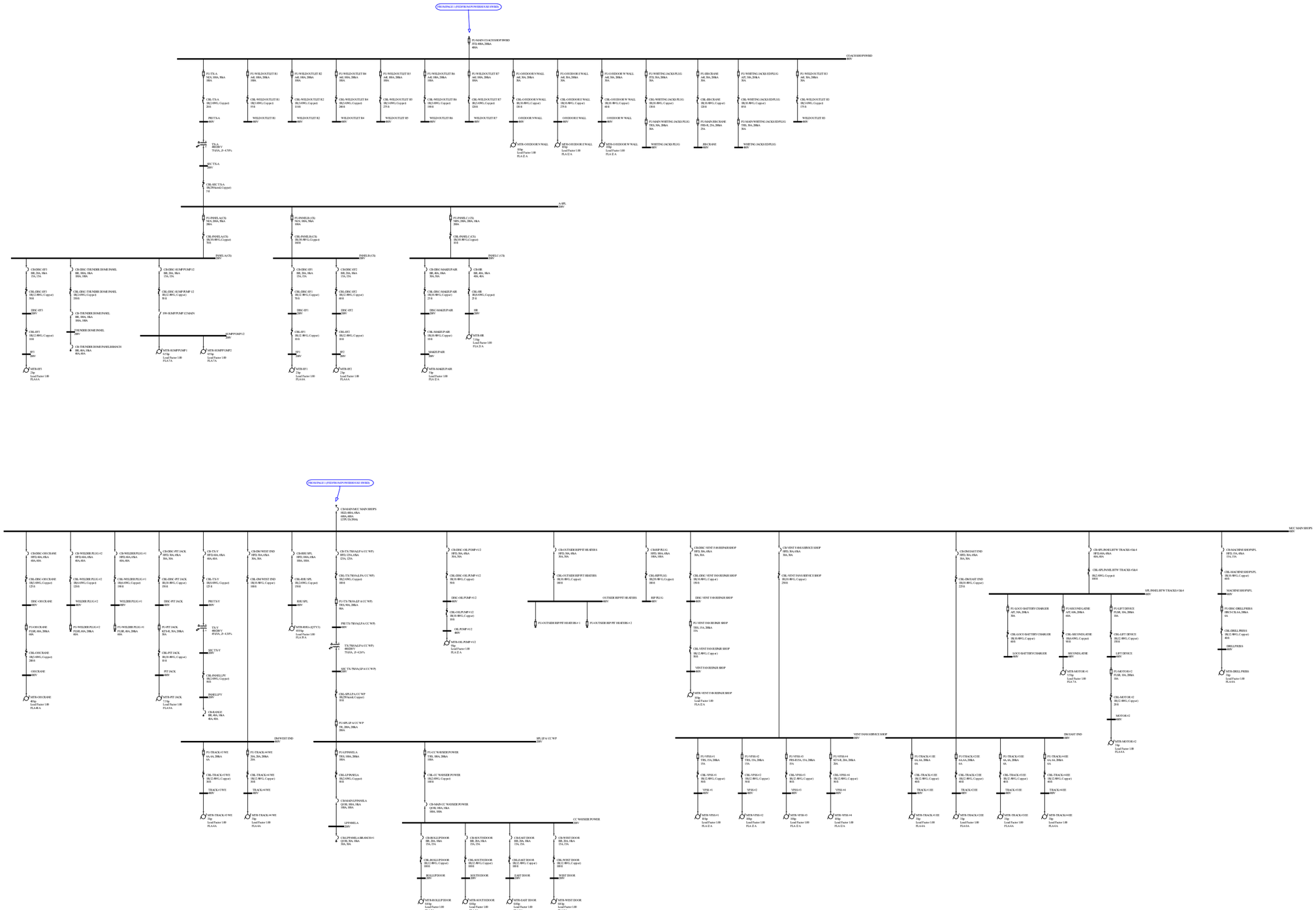
- The following had different fuse sizes used for the different phases:
  1) (FU-OUTSIDE RIP PIT HEATERS #1) There currently is QTY 2 – C15HR and QTY 1 – C20HR.
  2) (FU-OUTSIDE RIP PIT HEATERS #2) There currently is QTY 2 – C15HR and QTY 1 – C20HR.
  3) (FU-TRACK 4 WE) There currently is QTY 1 – 10 Amp HRC Fuse (Form II), QTY 1 – 6 Amp HRC Fuse (Form II) and QTY 1 – 20 Amp HRC Fuse (Form II).

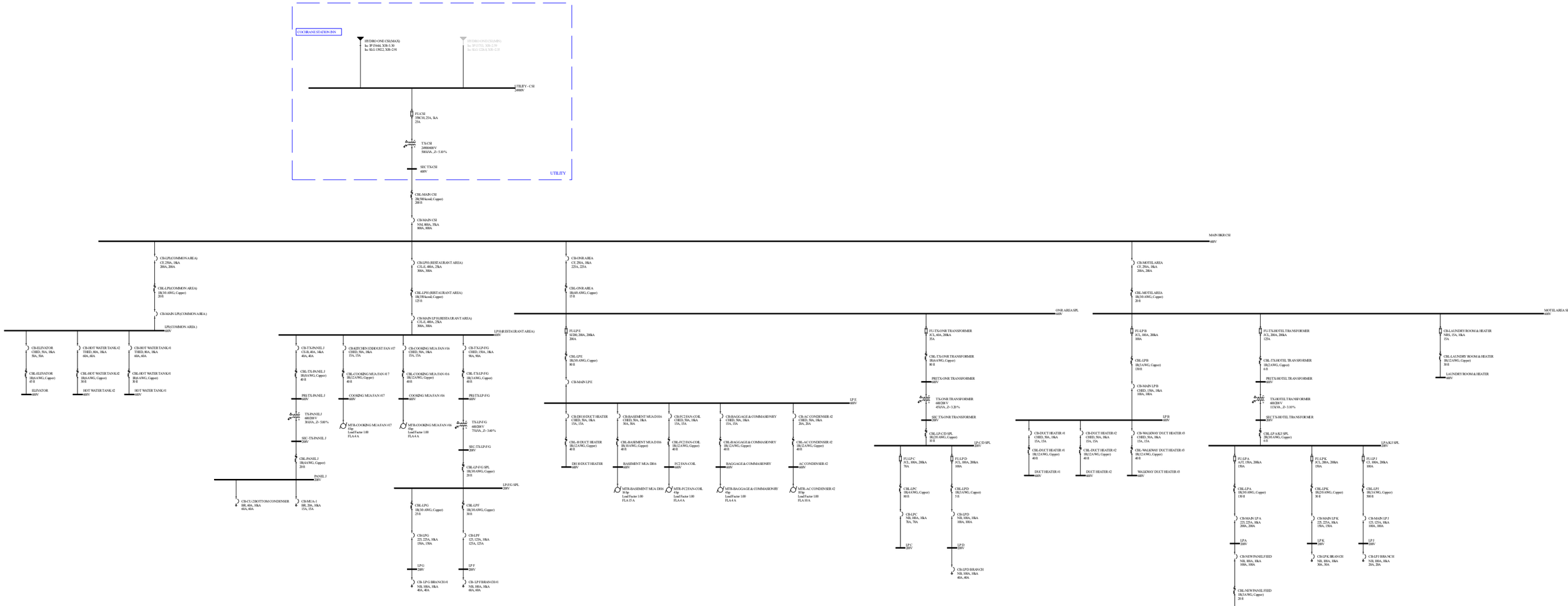
  We recommend replacing the fuses with the same size and type. A 15 A time-delay fuse would be a suitable option, such as a 15 A AJT-type fuse with a 200 kA short-circuit rating.

2.5 System Model and Input Data


COCHRANE FREIGHT
UTILITY
HYDRO ONE CF (MAX)
Isc 3P 1678.3, X/R=4.41
Isc SLG 1532.2, X/R=3.59
HYDRO ONE CF (MIN)
Isc 3P 1488.8, X/R=3.42
Isc SLG 1362.1, X/R=2.89
UTILITY - CF
24900V
FU-CF
T-Tin, 10T, 10A, 5kA
10A
TX-CF
24900/208 V
75 kVA , Z= 1.80 %
SEC TX-CF
208V
CBL-MAIN PANEL CF
1R(3/0 AWG, Copper)
150 ft
FU-MAIN PANEL CF
CRN, 200A, 10kA
200A
MAIN PANEL CF
208V
CB-PP (C-H)
NH, 100A, 10kA
60A, 60A
CBL-PP (C-H)
1R(6 AWG, Copper)
25 ft
PP (C-H)
208V
CB-PP (C-H) BRANCH
BAB, 40A, 10kA
40A, 40A


TOUCHDOWN: 600 (P3 OR 600NGA) PART 1
UTILITY
NORTHERN ONTARIO WIRES (66 KV)
kv: 69
kv: 115/69.3, X/R=10
kv: 230/115/69.3, X/R=20
POLE 13
27600V
XLN-13-15
R: 1.774000 Ohm/mi
X: 0.932213 Ohm/mi
X/R: 0.525
Xs: 0.2141 MOhm/mi
0.047 mi
XLN-13-RISER
R: 1.774000 Ohm/mi
X: 0.932213 Ohm/mi
X/R: 0.525
Xs: 0.2141 MOhm/mi
0.048 mi
Pole-15
27600V
RISER POLE
27600V
XLN-15-16
R: 1.774000 Ohm/mi
X: 0.932213 Ohm/mi
X/R: 0.525
Xs: 0.2141 MOhm/mi
0.036 mi
Pole-16
27600V
XLN-16-17
R: 1.774000 Ohm/mi
X: 0.932213 Ohm/mi
X/R: 0.525
Xs: 0.2141 MOhm/mi
0.036 mi
Pole-17
27600V
FU-TX-T2
MSHL, 10A/HA
TX-T2
27600/600 V
1000 kVA, Z=7.20 %
SEC-TX-T2
600V
FU-TX-E1
MSHL, 5A/HA
TX-T1
27600/240 V
100 kVA, Z=5.20 %
SEC-TX-T1
240V
CBL-TS3-N
1/0,7000 kcmL Copper)
70 ft
FU-TX-90
Fuse(A.070, 65A, 7kA
65 A
CBL-TX-N65/SIDE
(1/0,4/0 AWG, Copper)
40 ft
PSE TX-N65/SIDE
27600V
TX-N65/SIDE
15000/4160 V
2000 kVA, Z =6.00 %
SEC.TX-N65/SIDE
4160V
FU-TX-T1
Fuse(A.070, 65A, 7kA
65 A
CBL-TX-N65/SIDE
(1/0,4/0 AWG, Copper)
40 ft
PSE TX-N65/SIDE
27600V
TX-N65/SIDE
15000/4160 V
2000 kVA, Z =6.00 %
SEC.TX-N65/SIDE
4160V
SEC-T-1
2400/240 V
225 kVA, Z =2.10 %
SEC-T-1
600V
CBL-5/1 DIP POLE
(2)1/0 AWG, Copper)
125 ft
TS1 DIP/POLE
240V
CBL-5/1 SEC-L
(4)750 kcmil Copper)
125 ft
FU-FUEL.HOUSE
NGX, 350A, 70kA
350 A
FUEL HOUSE SPL
600V
FU-SS-REFUEL PUMP-L
Fuse(A.070, 65A, 7kA
65 A
CBL-SS-REFUEL PUMP-L
(4)4/0 AWG, Copper)
25 ft
SS-REFUEL PUMP-L
600V
SS-REFUEL PUMP
FU-SS-OFFLOAD PUMP-L
Fuse(A.070, 65A, 7kA
65 A
CBL-SS-OFFLOAD PUMP-L
(4)4/0 AWG, Copper)
25 ft
SS-OFFLOAD PUMP-L
600V
SS-OFFLOAD PUMP
FU-TX-SWEL. HS
Fuse(A.070, 65A, 7kA
65 A
CBL-TX-SWEL.HS
(4)2/0 AWG, Copper)
25 ft
SW-TX-SWEL.HS
600V
TX-SWEL.HS
600/208 Y
HS-TX-SWEL.HS
600V
SEC-TX-SWEL.HS
600V
CB-SWEL.HS
600/208 Y
HS-TX-SWEL.HS
600V
CB-SWEL.HS BRANCH
600, 60A, 10kA
60A, 60A
CB-TRACK1 WAYSIDE
800A, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-TRACK1 WAYSIDE
2/0(350 kcmiL Copper)
10 ft
TRACK1 WAYSIDE
600V
CB-TRACK2 WAYSIDE
800A, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-TRACK2 WAYSIDE
2/0(350 AWG, Copper)
50 ft
TRACK2 WAYSIDE
600V
CB-TRACK3 WAYSIDE
400, 400, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-TRACK3 WAYSIDE
2/0(350 AWG, Copper)
60 ft
TRACK3 WAYSIDE
600V
CB-TRACK4 WAYSIDE
400, 400, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-TRACK4 WAYSIDE
2/0(300 kcmiL Copper)
270 ft
TRACK4 WAYSIDE
600V
CB-4PU WAYSIDE
400, 400, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-4PU WAYSIDE
2/0(400 AWG, Copper)
100 ft
4PU WAYSIDE
600V
CB-HUNKHOUSE WAYSIDE
400, 400, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-HUNKHOUSE WAYSIDE
2/0(300 kcmiL Copper)
40 ft
HUNKHOUSE WAYSIDE
600V
CB-TRACK1 WAYSIDE
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-TRACK1 WAYSIDE
2/0(350 kcmiL Copper)
10 ft
TRACK1 WAYSIDE
600V
CB-TRACK2 WAYSIDE
800A, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-TRACK2 WAYSIDE
2/0(350 AWG, Copper)
50 ft
TRACK2 WAYSIDE
600V
CB-TRACK3 WAYSIDE
400, 400, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-TRACK3 WAYSIDE
2/0(350 AWG, Copper)
60 ft
TRACK3 WAYSIDE
600V
CB-TRACK4 WAYSIDE
400, 400, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-TRACK4 WAYSIDE
2/0(300 kcmiL Copper)
270 ft
TRACK4 WAYSIDE
600V
CB-4PU WAYSIDE
400, 400, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-4PU WAYSIDE
2/0(400 AWG, Copper)
100 ft
4PU WAYSIDE
600V
CB-HUNKHOUSE WAYSIDE
400, 400, 800A, 42kA
800A, 800A
LSPI V0.7/1.0-800Ax
CBL-HUNKHOUSE WAYSIDE
2/0(300 kcmiL Copper)
40 ft
HUNKHOUSE WAYSIDE
600V
FU-SS-REFUEL PUMP-L
Fuse(A.070, 65A, 7kA
65 A
CBL-SS-REFUEL PUMP-L
(4)4/0 AWG, Copper)
25 ft
SS-REFUEL PUMP-L
600V
SS-REFUEL PUMP
SS-REFUEL PUMP-N
600V
CBL-4P PUMP SOUTH
(3)2/0 AWG, Copper)
25 ft
4P PUMP SOUTH
600V
MTR-4P PUMP SOUTH
150 hp
Load Factor 1.00
FLA 20 A
SS-REFUEL PUMP-E
600V
CBL-4P PUMP NORTH
(3)4/0 AWG, Copper)
10 ft
4P PUMP NORTH
600V
MTR-4P PUMP NORTH
150 hp
Load Factor 1.00
FLA 5A
FU-SS-OFFLOAD PUMP-L
Fuse(A.070, 65A, 7kA
65 A
CBL-SS-OFFLOAD PUMP-L
(4)4/0 AWG, Copper)
25 ft
SS-OFFLOAD PUMP-L
600V
SS-OFFLOAD PUMP
SS-OFFLOAD PUMP-N
600V
CBL-OLP PUMP SOUTH
(3)4/0 AWG, Copper)
25 ft
OLP PUMP SOUTH
600V
MTR-OLP PUMP SOUTH
150 hp
Load Factor 1.00
FLA 30A
SS-OFFLOAD PUMP-E
600V
CBL-OLP PUMP NORTH
(3)2/0 AWG, Copper)
10 ft
OLP PUMP NORTH
600V
MTR-OLP PUMP NORTH
150 hp
Load Factor 1.00
FLA 5A
FU-TX-SWEL. HS
Fuse(A.070, 65A, 7kA
65 A
CBL-TX-SWEL.HS
(4)2/0 AWG, Copper)
25 ft
SW-TX-SWEL.HS
600V
TX-SWEL.HS
600/208 Y
HS-TX-SWEL.HS
600V
SEC-TX-SWEL.HS
600V
CBL-SWEL.HS
(3)2/0 AWG, Copper)
10 ft
CB-SWEL.HS
65kA, 225A, 22kA
200A, 200A
SWEL.HS
600V
CB-SWEL.HS BRANCH
600, 60A, 10kA
60A, 60A
CB-COMPRESSOR FUTURE
HFD, 70A, 65kA
70A, 70A
CBL-COMPRESSOR FUTURE
1/0(4/0 AWG, Copper)
60 ft
COMPRESSOR FUTURE
600V
MTR-COMPRESSOR FUTURE
25 hp
Load Factor 1.00
FLA 32 A
CB-DISC-BIG-AIR COMPRESSOR
HFD, 40A, 65kA
40A, 40A
DISC-BIG-AIR COMPRESSOR
600V
FU-BIG-AIR COMPRESSOR
FCNH/1, 45A, 20kA
45A
CBL-BIG-AIR COMPRESSOR
(3)2/0 AWG, Copper)
25 ft
BIG AIR COMP RESSOR
600V
MTR-BIG-AIR COMPRESSOR
50 hp
Load Factor 1.00
FLA 52 A
CB-DISC-COMPRESSOR 250P
HFD, 100A, 65kA
40A, 60A
CBL-DISC-COMPRESSOR
(3)2/0 AWG, Copper)
60 ft
DISC-COMPRESSOR
600V
FU-COMPRESSOR
AJT, 30A, 20kA
30A
CBL-COMPRESSOR
(3)2/0 AWG, Copper)
25 ft
COMPRESSOR
600V
MTR-COMPRESSOR
50 hp
Load Factor 1.00
FLA 30A
CB-COACH SHOP SWBD
HKD, 400A, 65kA
400A, 400A
CBL-MAIN COACH SHOP SWBD
2X(350 kcmiL Copper)
250 ft
CONTINUED ON PAGE
FU-MAIN COACH SHOP SWBD
FCL, 400A, 200kA
400A
COACH SHOP SWBD
600V
CB-MAIN MUCC MAIN SHOPS
HCD, 600A, 65kA
600A,600A
LSPI V0.7/1.0-600Ax
CBL-MUCC MAIN SHOPS
2X(350 kcmiL Copper)
200 ft
MUCC MAIN SHOPS
600V
CB-FAWEL ILI(TSI)
HFD, 150A, 65kA
200A, 200A
CBL-FAWEL ILI(TSI)
(3)2/0 AWG, Copper)
60 ft
CB-COMPRESSOR 100P
HFD, 80A, 65kA
80A, 80A
CBL-SMALL AIR COMP.
1/0(4/0 AWG, Copper)
60 ft
SMALL AIR COMP.
600V
MTR-SMALL AIR COMP.
25 hp
Load Factor 1.00
FLA 24 A
CB-POWERHOUSE SWBD
NGX, 800A, 70kA
800 A, 800 A
LCPU, R=800Ax
POWERHOUSE SWBD
600V
CB-TRANSFORMER.EXCITER SWITCH
HFD, 200A, 65kA
200A, 200A
CBL-TX-T-1 SPL
(8)3/0 AWG, Copper)
20 ft
SW.TX-T-1 SPL
600V
TX-T-1 SPL
45/2.5 kV
75 kVA, Z =1.70 %
SEC.TX-T-1 SPL
240V
CBL-TS-1-E
(8)3/0 AWG, Copper)
20 ft
TS-T-1-E
240V
TS-T-1
CB-TS-1-N
KD, 600A, 65kA
400A, 400A
TS-1-N
240V
TS-T-1-L
240 V
CBL-T-1 SPL
(8)2/0 AWG, Copper)
15 ft
T-1 SPL
600V
FU-LP-B
FLSR, 150A, 250kA
100A
CBL-LP-B
1/0(2 AWG, Copper)
60 ft
LP-B
600V
FU-MAIN SHOPP SPNL
TRS, 400A, 200kA
400A
CBL-MAIN SHOPP SL
1/0(700 kcmiL Copper)
200 ft
CB-MAIN SHOPP NL
CLD, 600A, 65kA
600A, 600A
LCPU, R=600Ax
MAIN SHOP PNL
600V
CB-PAWEL E (MS PNL)
HFD, 150A, 100kA
100A, 100A
CB-SPARE (MSPNL)
HFD, 20kA, 100kA
20kA, 20kA

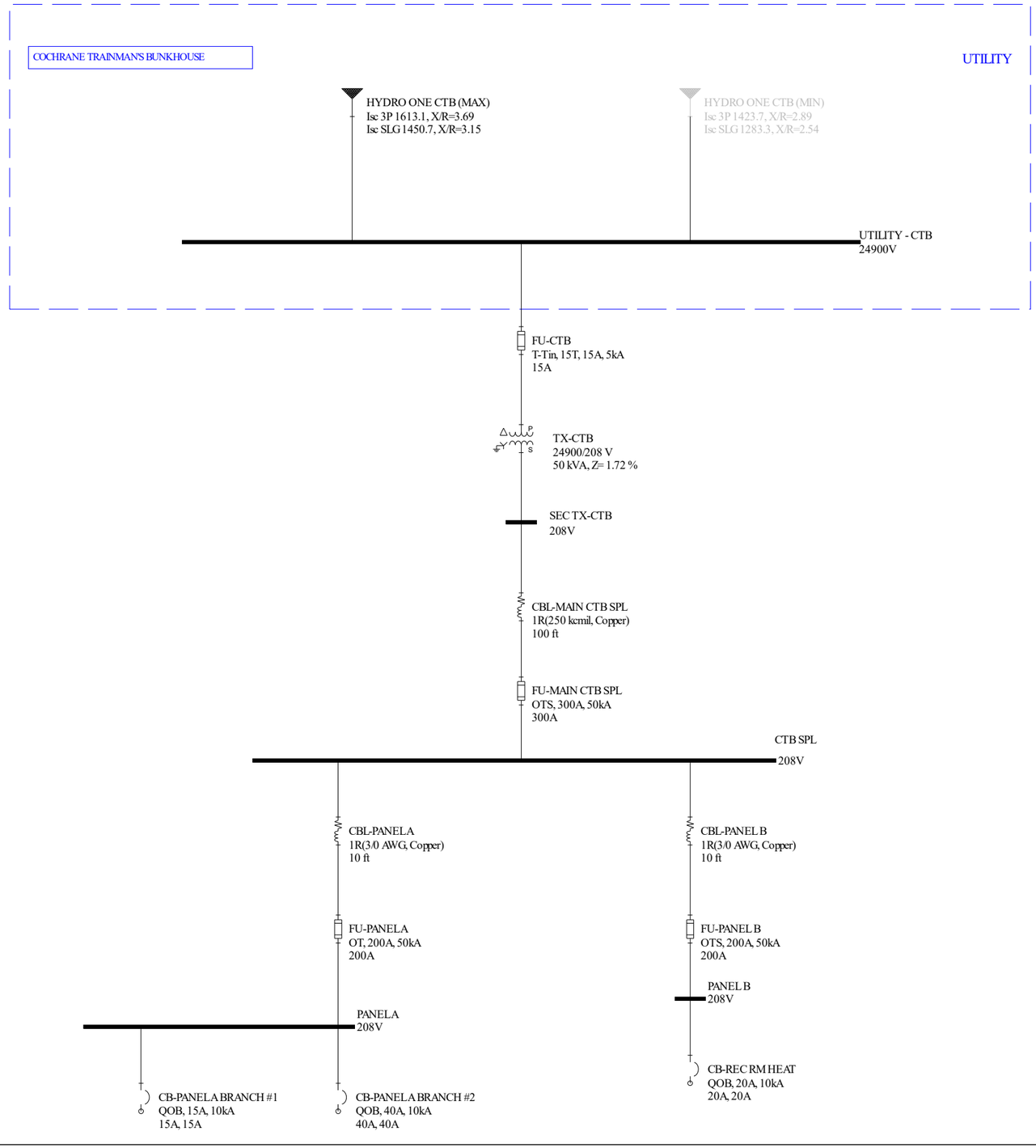

HIGH VOLTAGE UTILITY POWER HOUSE SWBD
FU-MAIN-UG-SUBSTATION-SWBD
3725 400A, 208kA
480V
MAIN SWBD
480V
FU-TX-A
NEX, 500A, 9kA
480A
CBL-TX-A
1RL5.00G, Copper1
2kft
PRI TX-A
480V
TX-A
480/208 Y
750kVA, Z= 4.70%
SEC TX-A
208Y
CBL-SEC TX-A
3RL750cmil, Copper1
1 kf
FU-WELDOUTLET R1
AIC 9kA, 208kA
100A
CBL-WELDOUTLET R1
1RL3.00G, Copper1
191ft
WELDOUTLET R1
480V
FU-WELDOUTLET R2
AIC 10kA, 208kA
400A
CBL-WELDOUTLET R2
1RL5.00G, Copper1
314ft
WELDOUTLET R2
480V
FU-WELDOUTLET R4
AIC 10kA, 208kA
100A
CBL-WELDOUTLET R4
1RL3.00G, Copper1
246ft
WELDOUTLET R4
480V
FU-WELDOUTLET R5
AIC 10kA, 208kA
100A
CBL-WELDOUTLET R5
1RL3.00G, Copper1
257ft
WELDOUTLET R5
480V
FU-WELDOUTLET R6
AIC 10kA, 208kA
100A
CBL-WELDOUTLET R6
1RL3.00G, Copper1
191ft
WELDOUTLET R6
480V
FU-WELDOUTLET R7
AIC 10kA, 208kA
100A
CBL-WELDOUTLET R7
1RL3.00G, Copper1
220ft
WELDOUTLET R7
480V
FU-OUTDOOR N WALL
AIC 9kA, 208kA
30A
CBL-OUTDOOR N WALL
8RL10.00G, Copper1
191ft
OUTDOOR N WALL
480V
MTR-OUTDOOR N WALL
0.0hp
Load Factor 1.00
FLA 0 A
FU-OUTDOOR E WALL
AIC 9kA, 208kA
30A
CBL-OUTDOOR E WALL
1RL10.00G, Copper1
257ft
OUTDOOR E WALL
480V
MTR-OUTDOOR E WALL
0.0hp
Load Factor 1.00
FLA 0 A
FU-OUTDOOR W WALL
AIC 9kA, 208kA
30A
CBL-OUTDOOR W WALL
8RL10.00G, Copper1
46ft
OUTDOOR W WALL
480V
MTR-OUTDOOR W WALL
0.0hp
Load Factor 1.00
FLA 0 A
FU-WHITING JACKS PLUG
TES, 30A, 208kA
30A
CBL-WHITING JACKS PLUG
8RL10.00G, Copper1
130ft
FU-MAIN WHITING JACKS PLUG
TES, 30A, 208kA
30A
WHITING JACKS PLUG
480V
FU-JIB CRANE
AIC 9kA, 208kA
30A
CBL-JIB CRANE
8RL10.00G, Copper1
120ft
FU-MAIN JIB CRANE
FRS-R, 25A, 208kA
25A
JIB CRANE
480V
FU-WHITING JACKS STEPS PLUG
TES, 30A, 208kA
30A
CBL-WHITING JACKS STEPS PLUG
8RL10.00G, Copper1
85ft
FU-MAIN WHITING JACKS STEPS PLUG
TES, 30A, 208kA
30A
WHITING JACKS STEPS PLUG
480V
FU-WELDOUTLET R3
AIC 9kA, 208kA
30A
CBL-WELDOUTLET R3
1RL3.00G, Copper1
273ft
WELDOUTLET R3
480V
A-SPL
120V
FU-PANELA(CS)
NEX, 200A, 9kA
200A
CBL-PANELA(CS)
8RL00.00G, Copper1
70ft
PANELA(CS)
120V
CB-EHC-1
HE, 20A, 10kA
15A, 15A
CBL-EHC-1
8RL12.00G, Copper1
70ft
EHC-1
208V
CBL-ST1
1RL12.00G, Copper1
10ft
ST1
240V
MTR-ST1
0.5hp
Load Factor 1.00
FLA 0 A
CB-EHC-THUNDER DOME PANEL
HE, 30A, 10kA
100A, 100A
CBL-EHC-THUNDER DOME PANEL
1RL2.00G, Copper1
250ft
CB-THUNDER DOME PANEL
HE, 100A, 10kA
100A, 100A
THUNDER DOME PANEL
480V
CB-THUNDER DOME PANEL#1&#2&#3&#4
HE, 60A, 10kA
80A, 60A
CB-EHC-SUMP PUMP 12
HE, 20A, 10kA
15A, 15A
CBL-EHC-SUMP PUMP 12
8RL12.00G, Copper1
90 ft
SW-SUMP PUMP 12 MAIN
SUMP PUMP 12
208V
MTR-SUMP PUMP1
0.5hp
Load Factor 1.00
FLA 0 A
MTR-SUMP PUMP2
0.5hp
Load Factor 1.00
FLA 0 A
FU-PANELB (CS)
NEX, 100A, 9kA
150A
CBL-PANELB(CS)
8RL00.00G, Copper1
60ft
PANELB (CS)
120V
CB-EHC-ST1
HE, 20A, 10kA
15A, 15A
CBL-EHC-ST1
8RL12.00G, Copper1
70ft
EHC-ST1
208V
CBL-ST1
8RL12.00G, Copper1
61ft
ST1
240V
MTR-ST1
1hp
Load Factor 1.00
FLA 0.0 A
CB-EHC-ST2
HE, 20A, 10kA
15A, 15A
CBL-EHC-ST2
8RL12.00G, Copper1
46ft
EHC-ST2
208V
CBL-ST2
8RL12.00G, Copper1
61ft
ST2
240V
MTR-ST2
1hp
Load Factor 1.00
FLA 0.0 A
FU-PANELC (CS)
NBN, 200A, 20kA, 18kA
200A
CBL-PANELC (CS)
8RL00.00G, Copper1
80 ft
PANELC (CS)
120V
CB-EHC-MAKEUP AIR
HE, 40A, 10kA
30A,30A
CBL-EHC-MAKEUP AIR
8RL00.00G, Copper1
25 ft
EHC-MAKEUP AIR
208V
CBL-MAKEUP AIR
8RL00.00G, Copper1
10 ft
MAKEUP AIR
240V
MTR-MAKEUP AIR
1hp
Load Factor 1.00
FLA 2.6 A
CB-HE
HE, 40A, 10kA
40A, 40A
CBL-HE
8RL4.00G, Copper1
25 ft
HE
208V
MTR-HE
1.5hp
Load Factor 1.00
FLA 2.6 A
HIGH VOLTAGE UTILITY POWER HOUSE SWBD
CB-MAIN-MCC MAIN SHOPS
HED, 800A, 65kA
600A, 600A
CT?? 1X1/0Al
MCC MAIN SHOPS
600V
CB-EHC-OH CRANE
HFD, 60A, 65kA
50A, 60A
CBL-EHC-OH CRANE
1RL3.00G, Copper1
120 ft
EHC-OH CRANE
600V
FU-OH CRANE
FUSE, 60A, 208kA
60A
CBL-OH CRANE
1RL3.00G, Copper1
180 ft
OH CRANE
600V
MTR-OH CRANE
0.0hp
Load Factor 1.00
FLA 48.5 A
CB-WELDER PLUG #2
HFD, 60A, 65kA
60A, 60A
CBL-WELDER PLUG #2
1RL4.00G, Copper1
120 ft
WELDER PLUG #2
600V
FU-WELDER PLUG #2
FUSE, 60A, 208kA
60A
CB-WELDER PLUG #1
HFD, 60A, 65kA
60A, 60A
CBL-WELDER PLUG #1
1RL6.00G, Copper1
190 ft
WELDER PLUG #1
600V
FU-WELDER PLUG #1
FUSE, 60A, 208kA
60A
CB-EHC-PIT JACK
HFD, 30A, 65kA
30A, 30A
CBL-EHC-PIT JACK
8RL10.00G, Copper1
190 ft
EHC-PIT JACK
600V
FU-PIT JACK
KTS-R, 30A, 208kA
30A
CBL-PIT JACK
8RL10.00G, Copper1
10 ft
PIT JACK
600V
MTR-PIT JACK
1.5hp
Load Factor 1.00
FLA 0 A
CB-TX-Y
HFD, 60A, 65kA
60A, 60A
CBL-TX-Y
1RL6.00G, Copper1
125 ft
PRI TX-Y
600V
TX-Y
480/208 Y
450kVA, Z= 4.50%
SEC TX-Y
208Y
CBL-PANELPY
1RL0.00G, Copper1
30ft
PANELPY
208Y
CB-PANEL
HE, 40A, 10kA
40A, 40A
CB-EHC-GM WEST END
HFD, 30A, 65kA
30A, 30A
CBL-GM WEST END
1RL0.00G, Copper1
180ft
WEST END
208Y
CB-HHC/SPL
HFD, 100A, 65kA
100A, 100A
CBL-HHC/SPL
1RL2.00G, Copper1
150ft
HHC/SPL
480V
MTR-HHC/SPL (QTY:1)
0.0hp
Load Factor 1.00
FLA 0 A
CB-TX-750/ALP A CU WP1
HFD, 125A, 65kA
125A, 125A
CBL-TX-750/ALP A CU WP1
3RL500G, Copper1
60ft
FU-TX-750/ALP A CU WP1
TES, 90A, 208kA
90A
PRI TX-750/ALP A CU WP1
600V
TX-750/ALP A CU WP1
480/208 Y
750kVA, Z=-2.26%
SEC TX-750/ALP A CU WP1
208Y
CBL-SPLLP A CU WP
3RL750cmil, Copper1
20 ft
FU-SPLLP A CU WP
TE, 200A, 208kA
200A
FU-LP/NWELA
TES, 100A, 208kA
100A
CBL-LP/NWELA
3RL2/0AG, Copper1
70 ft
CB-MAIN-LP/NWELA
QOB, 100A, 10kA
100A, 100A
LP/NWELA
208Y
CB-LP/NWELA#1&#2&#3&#4&#5&#6
QOB, 30A, 10kA
30A, 30A
CB-CC WASHER POWER
HFD, 100A, 65kA
100A, 100A
CBL-CC WASHER POWER
1RL2.00G, Copper1
180 ft
CB-MAIN-CC WASHER POWER
QOB, 100A, 10kA
100A, 100A
CC WASHER POWER
208Y
CB-ROLLUP DOOR
HE, 20A, 10kA
15A, 15A
CBL-ROLLUP DOOR
1RL12.00G, Copper1
230ft
ROLLUP DOOR
208Y
MTR-ROLLUP DOOR
0.0hp
Load Factor 1.00
FLA 0 A
CB-SOUTH DOOR
HE, 20A, 10kA
15A, 15A
CBL-SOUTH DOOR
1RL12.00G, Copper1
200ft
SOUTH DOOR
208Y
MTR-SOUTH DOOR
0.0hp
Load Factor 1.00
FLA 0 A
CB-EAST DOOR
HE, 20A, 10kA
15A, 15A
CBL-EAST DOOR
1RL12.00G, Copper1
160ft
EAST DOOR
208Y
MTR-EAST DOOR
0.0hp
Load Factor 1.00
FLA 0 A
CB-WEST DOOR
HE, 20A, 10kA
15A, 15A
CBL-WEST DOOR
1RL12.00G, Copper1
160ft
WEST DOOR
208Y
MTR-WEST DOOR
0.0hp
Load Factor 1.00
FLA 0 A
CB-OUTSIDE RIP/TIE HEATERS
HFD, 30A, 65kA
30A, 30A
CBL-OUTSIDE RIP/TIE HEATERS
8RL8.00G, Copper1
180 ft
OUTSIDE RIP/TIE HEATERS
600V
FU-OUTSIDE RIP/TIE HEATERS #1
FU-OUTSIDE RIP/TIE HEATERS #2
CB-RIP PLUG
HFD, 60A, 65kA
100A, 100A
CBL-RIP PLUG
3RL00.00G, Copper1
180 ft
RIP PLUG
120V
CB-EHC-MNT FAN/SERVICE SHOP
HFD, 30A, 65kA
30A, 30A
CBL-EHC-MNT FAN/SERVICE SHOP
1RL10.00G, Copper1
190 ft
EHC-MNT FAN/SERVICE SHOP
600V
FU-MNT FAN/SERVICE SHOP
TES, 25A, 208kA
25A
CBL-MNT FAN/SERVICE SHOP
3RL12.00G, Copper1
90 ft
MNT FAN/SERVICE SHOP
600V
MTR-MNT FAN/SERVICE SHOP
0.0hp
Load Factor 1.00
FLA 0 A
CB-MNT FAN/SERVICE SHOP
HFD, 30A, 65kA
30A, 30A
CBL-MNT FAN/SERVICE SHOP
2RL00.00G, Copper1
250ft
MNT FAN/SERVICE SHOP
600V
CB-GM EAST END
HFD, 30A, 65kA
30A, 30A
CBL-GM EAST END
1RL00.00G, Copper1
220 ft
GM EAST END
600V
CB-SPL/NWELB/TW TRACKS #5&6
HFD, 60A, 65kA
60A, 60A
CBL-SPL/NWELB/TW TRACKS #5&6
1RL2.00G, Copper1
180ft
SPL/NWELB/TW TRACKS #5&6
600V
FU-LOCO BATTERY CHARGER
AIC 10kA, 208kA
30A
CBL-LOCO BATTERY CHARGER
3RL0.00G, Copper1
40ft
LOCO BATTERY CHARGER
600V
FU-SECOND LATHE
AIC 10kA, 208kA
60A
CBL-SECOND LATHE
3RL6.00G, Copper1
90 ft
SECOND LATHE
600V
MTR-MOTOR #1
0.5hp
Load Factor 1.00
FLA 7A
FU-LIFT DEVICE
FUSE, 30A, 208kA
30A
CBL-LIFT DEVICE
3RL12.00G, Copper1
160ft
LIFT DEVICE
600V
FU-MOTOR #2
FUSE, 30A, 208kA
30A
CBL-MOTOR #2
3RL12.00G, Copper1
20 ft
MOTOR #2
600V
MTR-MOTOR #2
1hp
Load Factor 1.00
FLA 0 A
FU-TRACK #1 HE
AIC 9kA, 208kA
6A
CBL-TRACK #1 HE
3RL12.00G, Copper1
40ft
TRACK #1 HE
600V
MTR-TRACK #1 HE
1hp
Load Factor 1.00
FLA 0 A
FU-TRACK #2 HE
AIC 9kA, 208kA
6A
CBL-TRACK #2 HE
3RL12.00G, Copper1
40ft
TRACK #2 HE
600V
MTR-TRACK #2 HE
1hp
Load Factor 1.00
FLA 0 A
FU-TRACK #3 HE
AIC 9kA, 208kA
6A
CBL-TRACK #3 HE
3RL12.00G, Copper1
40ft
TRACK #3 HE
600V
MTR-TRACK #3 HE
1hp
Load Factor 1.00
FLA 0 A
FU-TRACK #4 HE
AIC 9kA, 208kA
6A
CBL-TRACK #4 HE
3RL12.00G, Copper1
40ft
TRACK #4 HE
600V
MTR-TRACK #4 HE
1hp
Load Factor 1.00
FLA 0 A
FU-MACHINE SHOP SPL
HFD, 15A, 65kA
15A, 15A
CBL-MACHINE SHOP SPL
3RL00.00G, Copper1
40ft
MACHINE SHOP SPL
600V
FU-DISC GRILL PRESS
HFD, CB, 15A, 208kA
6A
CBL-DRILL PRESS
3RL12.00G, Copper1
4ft
DRILL PRESS
600V
MTR-DRILL PRESS
0.5hp
Load Factor 1.00
FLA 6 A



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Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CSI
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

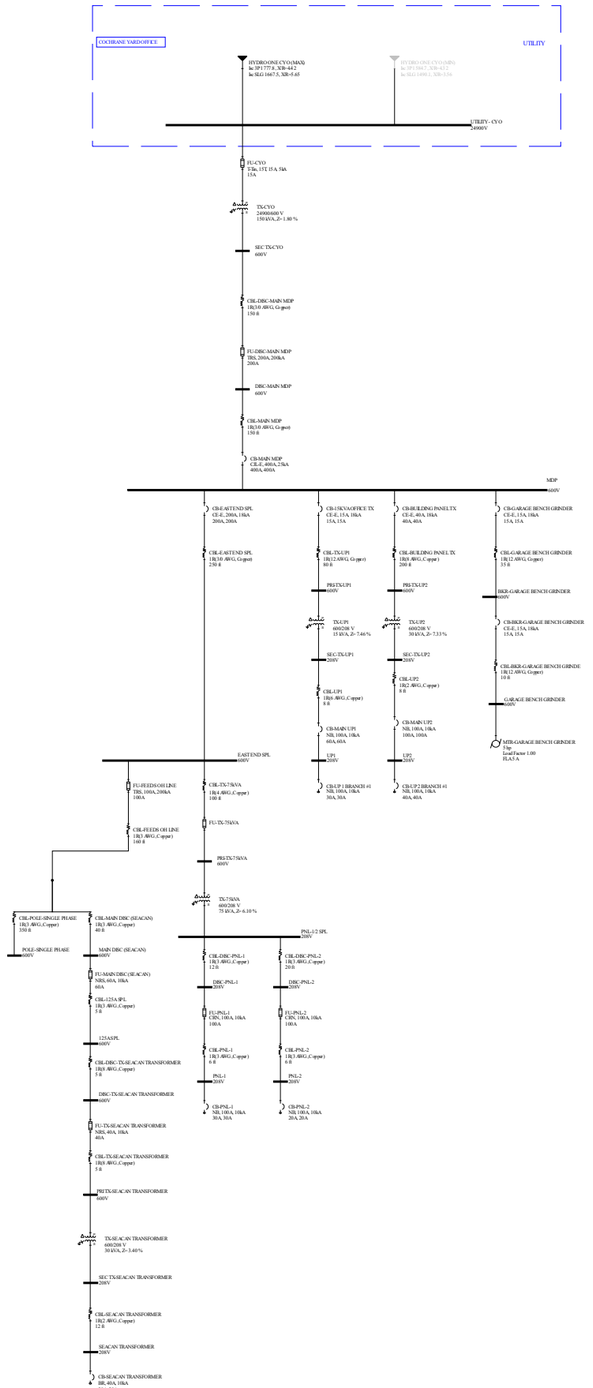
By: Kimberly Chigbo
Qualus Services Canada Ltd.
December 31, 2025



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Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CTB
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

By: Kimberly Chigbo
Qualus Services Canada Ltd.
December 31, 2025


COCHRANE YARD/OFFICE
UTILITY
HYDRO ONE CYO (MAIN)
kv: SP 1777.8 , XR= 64.2
ks: SEG 1667.5 , XR= 0.45
HYDRO ONE CYO (ALT)
kv: SP 1667.5 , XR= 63.2 ,
ks: SEG 1498.1 , XR= 5.9 6
UTILITY - CYO
14400V
FU-CYO
T/Ckt, 15T, 15 A, 5kA
15A
TX-CYO
2400/600V
150 kVA, Z= 1.80 %
SEC-TX-CYO
600V
CBL-DISC-MAIN MDP
1/0,3 0 AWG, G-pper)
150 ft
FU-DISC-MAIN MDP
TRS, 200A, 20kkA
200A
DISC-MAIN MDP
600V
CBL-MAIN MDP
1/0,3 0 AWG, G-pper)
150 ft
CB-MAIN MDP
CE-E, 400 A, 2.5kA
400A, 400A
MDP
600V
CB-EASTEND SPL
CE-E, 200A, 10kA
200A, 200A
CBL-EASTEND SPL
1/0,3 0 AWG, G-pper)
250 ft
CB-15KVAOFFICE TX
CE-E, 15 A, 10kA
15 A, 15 A
CBL-TX-UP1
1/0,12 AWG, G-pper)
80 ft
PRI-TX-UP1
600V
TX-UP1
600/208 V
15 kVA, Z= 7.46 %
SEC-TX-UP1
208V
CBL-UP1
1/0,6 AWG, C-opper)
6 ft
CB-MAIN UP1
NB, 100A, 10kA
60A, 60A
UP1
208V
CB-UP 1 BRANCH #1
NB, 100A, 10kA
30A, 30A
CB-BUILDING PANEL TX
CE-E, 40 A, 10kA
40A, 40A
CBL-BUILDING PANEL TX
1/0,3 AWG, C-opper)
200 ft
PRI-TX-UP2
600V
TX-UP2
600/208 V
30 kVA, Z= 7.33 %
SEC-TX-UP2
208V
CBL-UP2
1/0,2 AWG, C-opper)
8 ft
CB-MAIN UP2
NB, 100A, 10kA
100A, 100A
UP2
208V
CB-UP 2 BRANCH #1
NB, 100A, 10kA
40A, 40A
CB-GARAGE BENCH GRINDER
CE-E, 15 A, 10kA
15 A, 15 A
CBL-GARAGE BENCH GRINDER
1/0,12 AWG, G-pper)
35 ft
8KR-GARAGE BENCH GRINDER
600V
CB-8KR-GARAGE BENCH GRINDER
CE-E, 15 A, 10kA
15 A, 15 A
CBL-8KR-GARAGE BENCH GRINDE
1/0,12 AWG, G-pper)
10 ft
GARAGE BENCH GRINDER
600V
MTR-GARAGE BENCH GRINDER
1.5HP
Load Factor 1.00
FLA 5 A
EAST END SPL
600V
FU-FEEDS OH LINE
TRS, 100A, 200kA
100A
CBL-FEEDS OH LINE
1/0,3 AWG, C-opper)
160 ft
CBL-TX-75KVA
1/0,4 AWG, C-opper)
100 ft
FU-TX-75KVA
PRI-TX-75KVA
600V
TX-75KVA
600/208 V
75 kVA, Z= 6.10 %
PNL-1/2 SPL
208V
CBL-POLE-SINGLE PHASE
1/0,3 AWG, C-opper)
250 ft
POLE-SINGLE PHASE
600V
CBL-MAIN DISC (SEACAN)
1/0,3 AWG, Copper)
40 ft
MAIN DISC (SEACAN)
600V
FU-MAIN DISC (SEACAN)
NRS, 60A, 10kA
60A
CBL-125A SPL
1/0,3 AWG, Copper)
5 ft
125A SPL
600V
CBL-DISC-TX-SEACAN TRANSFORMER
1/0,6 AWG, Copper)
5 ft
DISC-TX-SEACAN TRANSFORMER
600V
FU-TX-SEACAN TRANSFORMER
NRS, 40A, 10kA
40A
CBL-TX-SEACAN TRANSFORMER
1/0,8 AWG, Copper)
5 ft
PRI-TX-SEACAN TRANSFORMER
600V
TX-SEACAN TRANSFORMER
600/208 V
30 kVA, Z= 5.40 %
SEC-TX-SEACAN TRANSFORMER
208V
CBL-SEACAN TRANSFORMER
1/0,2 AWG, C-opper)
12 ft
SEACAN TRANSFORMER
208V
CB-SEACAN TRANSFORMER
HE, 60A, 10kA
30A, 30A
CBL-DISC-PNL-1
1/0,3 AWG, C-opper)
12 ft
DISC-PNL-1
208V
FU-PNL-1
CRN, 100A, 10kA
100A
CBL-PNL-1
1/0,3 AWG, C-opper)
6 ft
PNL-1
208V
CB-PNL-1
NB, 100A, 10kA
30A, 30A
CBL-DISC-PNL-2
1/0,3 AWG, C-opper)
20 ft
DISC-PNL-2
208V
FU-PNL-2
CRN, 100A, 10kA
100A
CBL-PNL-2
1/0,3 AWG, C-opper)
6 ft
PNL-2
208V
CB-PNL-2
NB, 100A, 10kA
20A, 20A

3 Short-Circuit Analysis

The short-circuit analysis firstly determines the magnitude of the highest short-circuit current expected, which is called the prospective currents, flowing throughout the power system in the event of a short-circuit fault and, secondly, verifies the adequacy of the interrupting equipment in the facility, based on the maximum prospective short-circuit fault current at its location.

3.1 Calculation Methods

The analysis was performed using the “Power Tools for Windows” software, an electrical engineering software developed by SKM Systems Analysis, Inc.

The calculation procedures are based on the recommendations provided in the American National Standards Institute (ANSI) C37.13-1981 [3], C37.010-1979 [4], and C37.5-1979 [5], and IEEE Standard 141 [6]. Taking into consideration both the AC decrement and DC decay components, the ANSI method calculates a single Thevenin equivalent fault point X/R ratio, based on separately derived R and X values at the fault point. From that X/R ratio, a single equivalent decay is determined for all sources at the fault location.

Low-voltage protective devices are usually rated to withstand and interrupt a specified symmetrical RMS (root-mean-square) current. When low-voltage protective devices are applied in a system with an X/R ratio greater than the X/R ratio for which the equipment was tested the protective devices evaluation should be based on the asymmetrical current limitation (the calculated symmetrical short-circuit current duty is multiplied by a corresponding multiplying factor found in the applicable standard to obtain the first-cycle asymmetrical RMS current duty, or first-cycle crest current duty, for comparison).

3.2 Analysis of Results

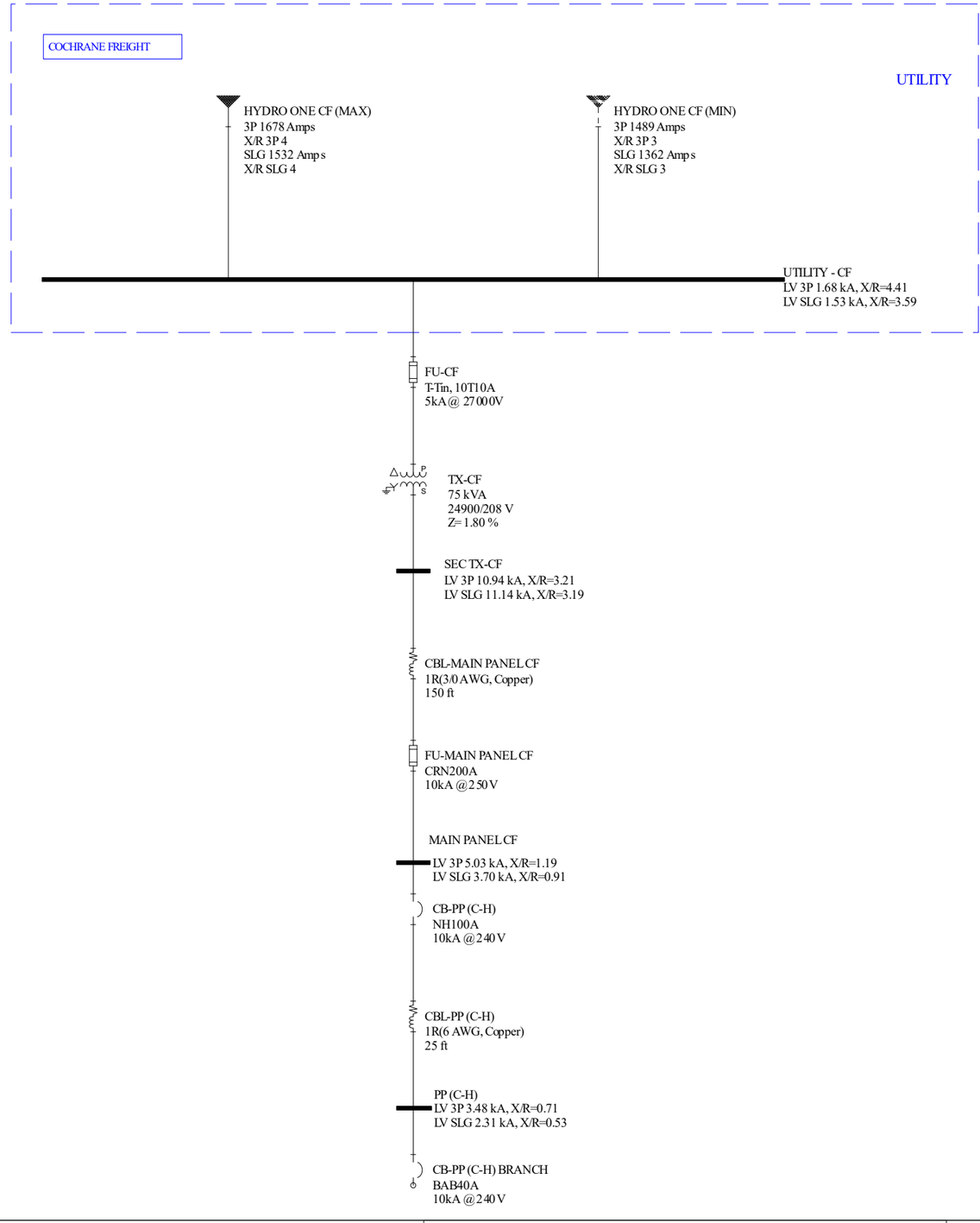
3.2.1 Short-Circuit Fault Current Calculation Results

The short-circuit calculations were performed for Normal Configuration – the utility power system is delivering the maximum short-circuit available current. This scenario represents the worst case with respect to the available fault current.

The values shown in the table are the calculated values of the Low Voltage, Momentary, and Interrupting duties for the three-phase and single-line-to-ground faults. The calculated values of the X/R ratios are as well shown in the table.

3.3 Scenario: Normal Configuration

(Utility Power System is Delivering Maximum Short-Circuit Available Current)

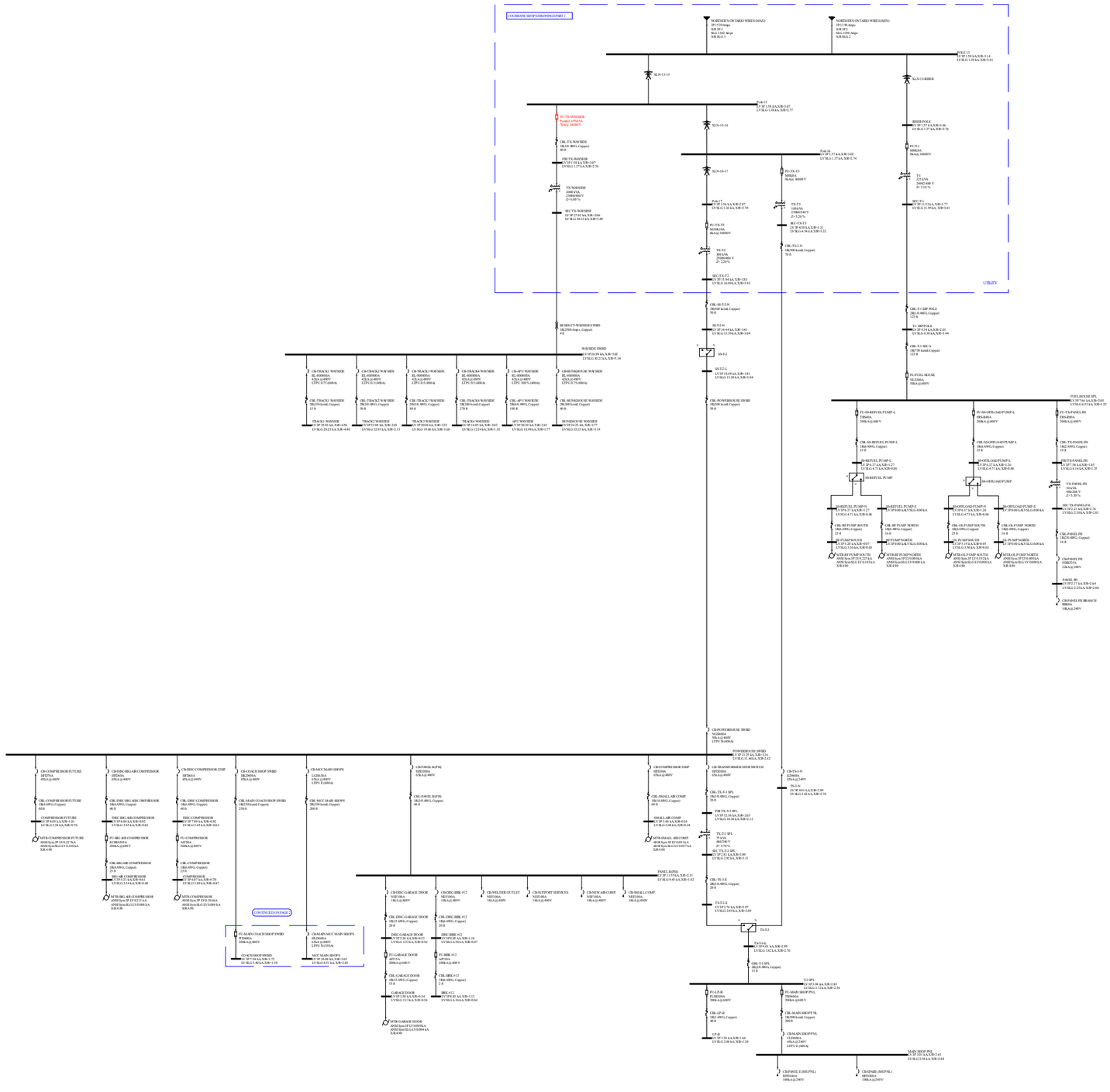


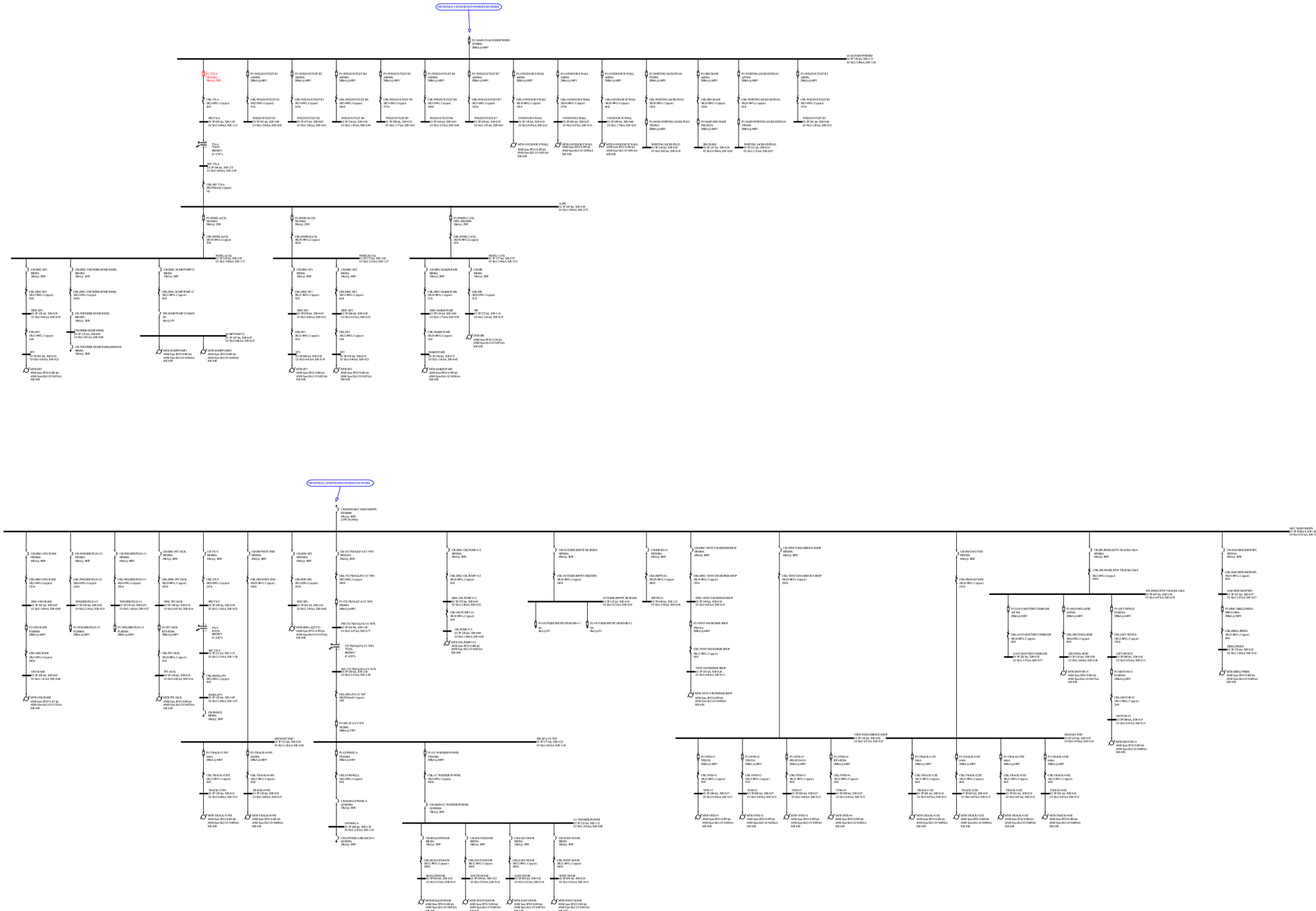
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Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CF
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

NOTE:
Short Circuit values shown in this single-line diagram are approximate representations of the calculated arc flash incident energy values and may not represent the Worst Case Short Circuit current for every bus. The Calculated Short Circuit Current table in this section must be consulted to obtain the highest calculated short circuit values.

By: Kimberly Chigbo
Qualus Services Canada Ltd.
December 31, 2025


COCHRANE SHOP/USHAVING/FIRST 1
SUMITOMO/ONTARIO WIRES (SOAS)
3P 1126 Amps
XJE 3P 1
XLG 1.5262 Amps
XJE/XLG 2
NORTHERN ONTARIO WIRES (NOS)
3P 1150 Amps
XJE 3P2
XLG 1356 Amps
XJE/XLG 2
POLE 11
XJE 3P 1.91 kA XJE-3.14
LV XLG 1.39 kA, XJE-2.81
XLN-13-15
XLN-13-HDER
Pole 13
XJE 3P 1.56 kA XJE-3.07
LV XLG 1.38 kA, XJE-2.77
FU-TX-WAYSIDE
Pushed-1570324
To ALL 1818877
XLN-15-16
HDER POLE
XJE 3P 1.37 kA XJE-3.06
LV XLG 1.37 kA, XJE-2.76
CBL-TX-WAYSIDE
3X4/0 4WG Copper)
10 ft
FU-U-1
600kA
10kAIC 34000V
PBETX-WAYSIDE
XJE 3P 1.56 kA XJE-3.07
LV XLG 1.37 kA, XJE-2.76
Pole 14
XJE 3P 1.37 kA XJE-3.02
LV XLG 1.37 kA, XJE-2.74
XLN-14-17
FU-TX-T1
600kA
10kAIC 34000V
TS-WAYSIDE
2000 kVA
2500/4160 V
Z= 6.00 %
Pole 17
XJE 3P 1.34 kA XJE-2.97
LV XLG 1.38 kA, XJE-2.70
TX-T1
1600 kVA
2500/4160 V
Z= 5.20 %
SECTS-WAYSIDE
XJE 3P 27.03 kA, XJE-5.66
LV XLG 10.213 kA, XJE-5.48
FU-TX-T2
1600kA
10kAIC 34000V
SECT-TX-T1
XJE 3P 4.59 kA, XJE-2.22
LV XLG 4.34 kA, XJE-3.32
CBL-TS-T-N
1X500kcmil Copper)
70 ft
TX-T2
1500 kVA
2500/4160 V
Z= 2.20 %
SECT-TX-T2
XJE 3P 2.91 kA, XJE-3.63
LV XLG 16.094 kA, XJE-5.93
CBL-SS-T-2-N
1X500 kcmil Copper)
70 ft
SS-T-2
XJE 3P 14.444 kA, XJE-5.81
LV XLG 13.394 kA, XJE-5.04
SS-T-2
SS-T-2-L
LV 3P 14.444 kA, XJE-5.81
LV XLG 13.39 kA, XJE-5.04
CBL-PUMPHOUSE 1PHD
1X500 kcmil Copper)
70 ft
BLSDUCT-WAYSIDE/OVWSD
4X 750 kcmi Copper)
4ft
WAYSIDE SWBD
LV 3P 24.99 kA, XJE-5.82
LV XLG 20.23 kA, XJE-5.34
CB-TRACK1 WAYSIDE
JXL 4000/800A
42kA (@480V
125% 53 (600A)
CB-TRACK2 WAYSIDE
42kA (@480V
125% 53 (600A)
CB-TRACK3 WAYSIDE
JXL 4000/800A
42kA (@480V
125% 53 (600A)
CB-TRACK4 WAYSIDE
JXL 4000/800A
42kA (@480V
125% 53 (600A)
CB-APU WAYSIDE
JXL 4000/800A
42kA (@480V
125% (600A)
CB-BUNKHOUSE WAYSIDE
JXL 4000/800A
42kA (@480V
125% 53 (600A)
CBL-TRACK1 WAYSIDE
1X(350 kcmil, Copper)
15 ft
CBL-TRACK2 WAYSIDE
2X(350 4WG, Copper)
30 ft
CBL-TRACK3 WAYSIDE
2X(350 4WG, Copper)
60 ft
CBL-TRACK4 WAYSIDE
2X(300 kcmil, Copper)
270 ft
CBL-APU WAYSIDE
2X(600 4WG, Copper)
100 ft
CBL-BUNKHOUSE WAYSIDE
2X(300 kcmil, Copper)
40 ft
TRACK1 WAYSIDE
XJ 3P 23.95 kA, XJE-4.56
LV XLG 20.25 kA, XJE-4.92
TRACK2 WAYSIDE
XJ 3P 22.186 kA, XJE-2.83
LV XLG 22.19 kA, XJE-3.13
TRACK3 WAYSIDE
XJ 3P 20.06 kA, XJE-2.22
LV XLG 19.46 kA, XJE-1.68
TRACK4 WAYSIDE
XJ 3P 14.83 kA, XJE-2.02
LV XLG 13.24 kA, XJE-1.52
APU WAYSIDE
XJ 3P 20.26 kA, XJE-2.41
LV XLG 19.94 kA, XJE-1.77
BUNKHOUSE WAYSIDE
XJ 3P 24.21 kA, XJE-3.77
LV XLG 23.23 kA, XJE-3.19
UTILITY
CBL-SS-T-2-IBP POLE
2X(1/0 4WG, Copper)
125 ft
S-1 DIP POLE
XJE 3P 2.91 kA, XJE-2.01
LV XLG 2.91 kA, XJE-1.44
CBL-T-1 IBP-S
1X(750 kcmil, Copper)
125 ft
FU-FUEL HOUSE
XLS/HA
70kA (@600V
FUEL HOUSE SPL
XJ 3P 3.6 kA, XJE-2.65
LV XLG 4.5 kA, XJE-3.32
FU-SS-HTFUEL PUMP-L
350kVA
2.6kAIC@ 600 V
FU-SS-HTFUEL PUMP-N
350kVA
2.6kAIC@ 600 V
FU-TS-PANEL HE
750 AMAs
200kAIC@ 600 V
CBL-SS-HTFUEL PUMP-L
1X(6 4WG, Copper)
25 ft
CBL-SS-HTFUEL PUMP-N
1X(250 kcmil, Copper)
25 ft
CBL-TS-PANEL FH
1X(2 4WG, Copper)
10 ft
SS-HTFUEL PUMP-L
XJ 3P 4.17 kA, XJE-1.27
LV XLG 4.71 kA, XJE-0.66
SS-HTFUEL PUMP-N
XJ 3P 4.17 kA, XJE-1.26
LV XLG 4.71 kA, XJE-0.66
SS-OFFLOAD PUMP-L
XJ 3P 4.17 kA, XJE-1.26
LV XLG 4.71 kA, XJE-0.66
SS-OFFLOAD PUMP
SS-HTFUEL PUMP-N
XJ 3P 4.17 kA, XJE-1.27
LV XLG 4.71 kA, XJE-0.66
SS-HTFUEL PUMP-L
XJ 3P 0.69 kA YXLG 0.69 kA
SS-OFFLOAD PUMP-N
XJ 3P 4.17 kA, XJE-1.26
LV XLG 4.71 kA, XJE-0.66
FU-OFFLOAD PUMP-L
XJ 3P0.88 kA YXLG0.69 kA
CBL-HTFUEL PUMP SOUTH
1X(6 4WG, Copper)
25 ft
CBL-HF PUMP NORTH
1X(6 4WG, Copper)
10 ft
CBL-OL PUMP SOUTH
1X(6 4WG, Copper)
25 ft
CBL-OL PUMP NORTH
1X(6 4WG, Copper)
10 ft
FU-PUMP NORTH
XJ 3P0.88 kA YXLG0.69 kA
FU-PUMP SOUTH
XJ 3P0.88 kA YXLG0.69 kA
FU-PUMP NORTH
XJ 3P0.88 kA YXLG0.69 kA
MTR-HF PUMP SOUTH
40HP,3ph/3P,1150VAC
460V,3ph/3E,112.5 FLA
XJE 4.00
MTR-HF PUMP NORTH
40HP,3ph/3P,1150VAC
460V,3ph/3E,112.5 FLA
XJE 4.00
MTR-OL PUMP SOUTH
40HP,3ph/3P,1150VAC
460V,3ph/3E,112.5 FLA
XJE 4.00
MTR-OL PUMP NORTH
40HP,3ph/3P,1150VAC
460V,3ph/3E,112.5 FLA
XJE 4.00
CB-POWERHOUSE 3WBD
NGD800A
125% 36 (600A)
POWERHOUSE 3WBD
XJ 3P 11.25 kA, XJE-3.54
LV XLG 11.466 A, XJE-2.62
CB-COMPRESSOR FUTURE
HFD70A
65kA (@480V
CBL-COMPRESSOR FUTURE
1X(6 4WG, Copper)
60 ft
COMPRESSOR FUTURE
XJ 3P 0.85 kA, XJE-1.85
LV XLG 0.74 kA, XJE-0.73
MTR-COMPRESSOR FUTURE
40HP,3ph/3P,1150VAC
460V,3ph/3E,112.5 FLA
XJE 4.00
CB-DISC-HIGAIR COMPRESSOR
HFD60A
65kA (@480V
CBL-DISC-HIG 4HCOMP HOUSE
1X(6 4WG, Copper)
40 ft
DISC-HIG-AIR COMPRESSOR
XJ 3P 5.69 kA, XJE-0.92
LV XLG 5.69 kA, XJE-0.63
FU-HIG-AIR COMPRESSOR
HJD60A
200kA (@480V
CBL-HIGAIR COMPRESSOR
1X(4 4WG, Copper)
25 ft
HIG AIR COMPRESSOR
XJ 3P 5.69 kA, XJE-0.92
LV XLG 5.69 kA, XJE-0.63
MTR-HIG AIR COMPRESSOR
40HP,3ph/3P,1150VAC
460V,3ph/3E,112.5 FLA
XJE 4.00
CB-DISC-COMPRESSOR 250P
HFD60A
65kA (@480V
CBL-DISC-COMPRESSOR
1X(4 4WG, Copper)
40 ft
DISC COMPRESSOR
XJ 3P 7.99 kA, XJE-0.92
LV XLG 5.69 kA, XJE-0.63
FU-COMPRESSOR
HFD60A
200kA (@480V
CBL-COMPRESSOR
1X(4 4WG, Copper)
25 ft
COMPRESSOR
XJ 3P 5.69 kA, XJE-0.70
LV XLG 5.69 kA, XJE-0.47
MTR-COMPRESSOR
40HP,3ph/3P,1150VAC
460V,3ph/3E,112.5 FLA
XJE 4.00
CB-COACH SHOP 3WBD
HCD600A
65kA (@480V
CBL-MAIN COACH SHOP 3WBD
1X(350 kcmil, Copper)
250 ft
CONTINUED ON PAGE
FU-MAIN COACH SHOP 3WBD
1T2000A
200kA (@480V
COACH SHOP 3WBD
XJ 3P 2.54 kA, XJE-1.72
LV XLG 5.40 kA, XJE-1.30
CB-MUC MAIN SHOPS
LGD800A
65kA (@480V
CBL-MUC MAIN SHOPS
2X(350 kcmil, Copper)
200 ft
CB-MAIN MUC MAIN SHOPS
HLD600A
65kA (@480V
125% 35(500A
MUC MAIN SHOPS
XJ 3P 33.68 kA, XJE-12.62
LV XLG 8.51 kA, XJE-2.02
CB-FAUEL B(FH)
HFD200A
65kA (@480V
CBL-FAUEL B(FH)
1X(1/0 4WG, Copper)
40 ft
PANEL B(FH)
XJ 3P 1.15 kA, XJE-2.32
LV XLG 0.49 kA, XJE-1.62
CB-DISC-GARAGE DOOR
NEF100A
10kAIC@480V
CB-DISC-HHK #12
NEF100A
25kAIC@ 480V
CB-WELDER OUTLET
NEF100A
10kAIC@480V
CB-SUPPORT SERVICES
NEF100A
10kAIC@480V
CB-NEW AIR COMP
NEF100A
10kAIC@480V
CB-SMALL COMP
NEF100A
10kAIC@480V
CBL-DISC-GARAGE DOOR
1X(12 4WG, Copper)
20 ft
CBL-DISC-HHK #12
1X(6 4WG, Copper)
20 ft
DISC-GARAGE DOOR
XJ 3P 0.26 kA, XJE-0.31
LV XLG 1.12 kA, XJE-0.56
DISC-HHK #12
XJ 3P 0.18 kA, XJE-1.18
LV XLG 4.59 kA, XJE-0.87
FU-GARAGE DOOR
AJT15A
200kA (@480V
FU-HHK #12
AJT10A
200kA (@480V
CBL-GARAGE DOOR
1X(12 4WG, Copper)
15 ft
CBL-HHK #12
1X(6 4WG, Copper)
2 ft
GARAGE DOOR
XJ 3P 1.92 kA, XJE-0.34
LV XLG 2.11 kA, XJE-0.24
HHK #12
XJ 3P 0.18 kA, XJE-1.13
LV XLG 4.59 kA, XJE-0.64
MTR-GARAGE DOOR
40HP,3ph/3P,1150VAC
460V,3ph/3E,112.5 FLA
XJE 4.00
CB-SPARE (MD FSL)
HFD200A
100kA (@240V
CB-P-SOLE (MD FSL)
HFD200A
100kA (@240V
MAIN SHOP FSL
XJ 3P 3.01 kA, XJE-2.41
LV XLG 2.56 kA, XJE-2.04
FU-MAIN SHOP FSL
2T800A
200kA (@600V
CBL-MAIN SHOPP SL
1X(300 kcmil, Copper)
200 ft
CB-MAIN SHOPP SL
CLD800A
125% 62 240V
125% 5 (800A
CB-P-SOLE (MD FSL)
HFD200A
100kA (@240V
CB-SPARE (MD FSL)
HFD200A
100kA (@240V
CB-TRANSFORMER XFER SWITCH
HFD200A
65kA (@ 480
CBL-TS-T-1 SPL
1X(3/0 4WG, Copper)
20 ft
PBETX-T-1 SPL
XJ 3P 21.66 kA, XJE-2.65
LV XLG 10.38 kA, XJE-1.12
TX-T-1 SPL
T1 VA
460/240 V
Z= 2.00 %
SEC-TX-T-1 SPL
XJ 3P 2.41 kA XJE-0.108
LV XLG 2.39 kA, XJE-0.11
CBL-TS-T-E
1X(3/0 4WG, Copper)
20 ft
TS-T-1-E
XJ 3P 2.76 kA, XJE-0.37
LV XLG 2.95 kA, XJE-2.69
TS-T-1
CBL-T-1 SPL
2X(3/0 4WG, Copper)
15 ft
T-1 SPL
XJ 3P1.96 kA, XJE-2.83
LV XLG 1.73 kA, XJE-2.54
FU-LP-B
FLSD250A
200kA (@600V
CBL-LP-B
1X(1 4WG, Copper)
40 ft
LP-B
XJ 3P 3.16 kA, XJE-1.64
LV XLG 2.88 kA, XJE-1.24
CB-P-SOLE (MD FSL)
HFD200A
100kA (@240V
CB-SPARE (MD FSL)
HFD200A
100kA (@240V
CB-P-SOLE (MD FSL)
HFD200A
100kA (@240V
P-SOLE, HE
XJ 3P 2.17 kA, XJE-2.64
LV XLG 2.23 kA, XJE-2.60
CB-P-SOLE, FH HE-SOCH
HJD60A
10kAIC@ 240V

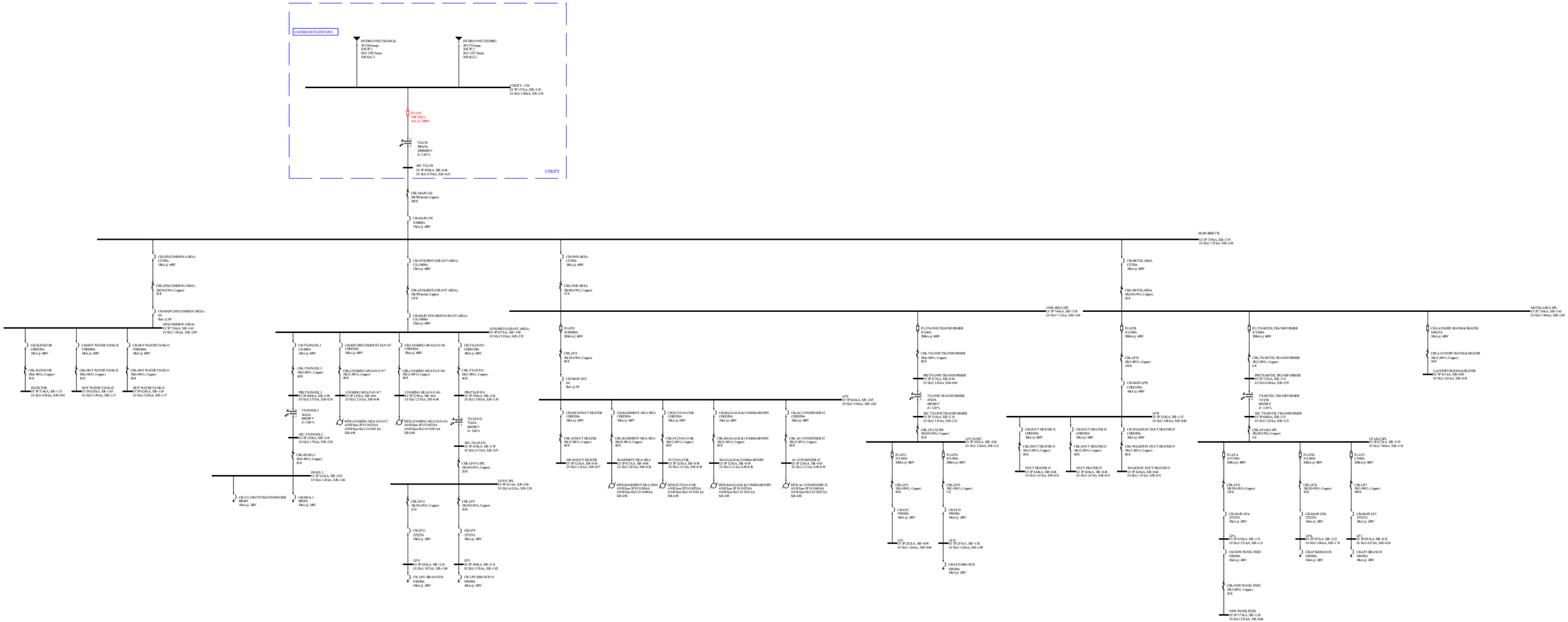


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Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CS (PAGE 2)
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

NOTE:
Short Circuit values shown in this single-line diagram are approximate representations of the calculated arc flash incident energy values and may not represent the Worst Case Short Circuit current for every bus. The Calculated Short Circuit Current table in this section must be consulted to obtain the highest calculated short circuit values.

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December 31, 2025



QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CSI
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

NOTE:
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COCHRANE TRAINMAN'S BUNKHOUSE

UTILITY

HYDRO ONE CTB (MAX)
3P 1613 Amps
X/R 3P 4
SLG 1451 Amps
X/R SLG 3

HYDRO ONE CTB (MIN)
3P 1424 Amps
X/R 3P 3
SLG 1283 Amps
X/R SLG 3

UTILITY - CTB
LV 3P 1.61 kA, X/R=3.69
LV SLG 1.45 kA, X/R=3.15

FU-CTB
T-Tin, 15T15A
5kA @ 27000V

TX-CTB
50 kVA
24900/208 V
Z= 1.72 %

SEC TX-CTB
LV 3P 7.75 kA, X/R=2.97
LV SLG 7.85 kA, X/R=2.97

CBL-MAIN CTB SPL
1R(250 kcmil, Copper)
100 ft

FU-MAIN CTB SPL
OTS300A
50kA@ 600 V

CTB SPL
LV 3P 5.40 kA, X/R=1.88
LV SLG 4.59 kA, X/R=1.52

CBL-PANEL A
1R(3/0 AWG, Copper)
10 ft

CBL-PANEL B
1R(3/0 AWG, Copper)
10 ft

FU-PANEL A
OT200A
50kA@ 250 V

FU-PANEL B
OTS200A
50kA@ 600 V

PANEL A
LV 3P 5.20 kA, X/R=1.79
LV SLG 4.36 kA, X/R=1.44

PANEL B
LV 3P 5.20 kA, X/R=1.79
LV SLG 4.36 kA, X/R=1.44

CB-PANEL A BRANCH #1
QOB15A
10kA@ 240 V

CB-PANEL A BRANCH #2
QOB40A
10kA@ 240 V

CB-REC RM HEAT
QOB20A
10kA@ 240 V

QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CTB
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

NOTE:
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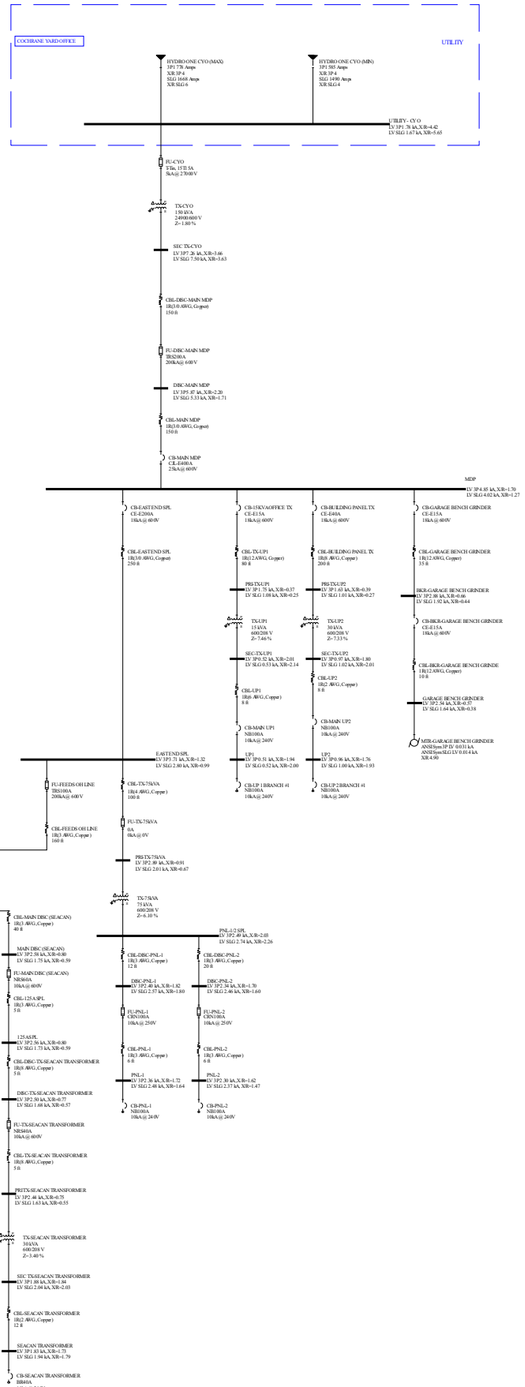

COCHRANE YARD OFFICE
UTILITY
HYDRO ONE CYO (MAX)
151.7 kA max
XR:3P4
SLG:1644 Amps
X/R:SLG 6
HYDRO ONE CYO (MIN)
151.7 kA max
XR:3P4
SLG:1490 Amps
X/R:SLG 4
UTILITY - CYO
LV 3Ph: 38 kA,X/R=4.42
LV SLG:1.67 kA, X/R=5.63
FU-CYO
T/Bs, 15 T/E 5A
8kA@ 2.76/8kV
TX-CYO
150 kVA
2.4/4.16/8 kV
Z= 1.66 %
SEC TX-CYO
LV 197.26 kA,X/R=3.66
LV SLG 7.50 kA, X/R=1.63
CBL-DISC-MAIN MDP
1R(3/0 AWG, Copper)
150 ft
FU-DISC-MAIN MDP
TPJ200A
200kA@ 600 V
DISC-MAIN MDP
LV 197.47 kA,X/R=2.20
LV SLG 5.33 kA, X/R=1.71
CBL-MAIN MDP
1R(3/0 AWG, Copper)
150 ft
CB-MAIN MDP
CL-E400A
2.5kA@ 600V
MDP
LV 3P:4.05 kA, X/R=1.70
LV SLG:4.02 kA, X/R=1.27
CB-EASTEND SPL
CL-E200A
18kA@ 600V
CBL-EASTEND SPL
1R(3/0 AWG, Copper)
250 ft
CB-15KVAOFFICE TX
CL-E 63 A
18kA@ 600V
CBL-TX-UP1
1R(1/2 AWG, Copper)
80 ft
PRI-TX-UP1
LV 3P:1.75 kA, X/R=0.37
LV SLG 1.08 kA, X/R=0.25
TX-UP1
15 kVA
2.4/4.16/8 kV
Z= 7.66 %
SEC-TX-UP1
LV 3P:0.32 kA, X/R=2.01
LV SLG:0.31 kA, X/R=2.14
CBL-UP1
1R(0 AWG, Copper)
8 ft
CB-MAIN UP1
NB100A
18kA@ 240V
UP1
LV 3P:0.31 kA, X/R=1.94
LV SLG:0.32 kA, X/R=2.00
CB-UP 1 BRANCH #1
NB100A
18kA@ 240V
CB-BUILDING PANEL TX
CL-E400A
18kA@ 600V
CBL-BUILDING PANEL TX
1R(0 AWG, Copper)
200 ft
PRI-TX-UP2
LV 3P:1.63 kA, X/R=0.39
LV SLG 1.03 kA, X/R=0.27
TX-UP2
30 kVA
2.4/4.16/8 kV
Z= 5.13 %
SEC-TX-UP2
LV 3P:0.97 kA, X/R=1.80
LV SLG 1.02 kA, X/R=2.01
CBL-UP2
1R(2 AWG, Copper)
8 ft
CB-MAIN UP2
NB100A
18kA@ 240V
UP2
LV 3P:0.96 kA, X/R=1.76
LV SLG 1.00 kA, X/R=1.93
CB-UP 2 BRANCH #1
NB100A
18kA@ 240V
CB-GARAGE BENCH GRINDER
CL-E 15 A
18kA@ 480V
CBL-GARAGE BENCH GRINDER
1R(12 AWG, Copper)
51 ft
BKR-GARAGE BENCH GRINDER
LV 3P:2.38 kA, X/R=0.46
LV SLG 1.92 kA, X/R=0.44
CB-BKR-GARAGE BENCH GRINDER
CL-E 15 A
18kA@ 480V
CBL-BKR-GARAGE BENCH GRINDE
1R(12 AWG, Copper)
10 ft
GARAGE BENCH GRINDER
LV 3P:1.64 kA, X/R=0.38
LV SLG 1.64 kA, X/R=0.38
MTR-GARAGE BENCH GRINDER
Motor, 3P,5D 0.033 kA
60/50 hz,SLG LV 0.01-0 kA
X/R 4.90
E-MTEND SPL
LV 3P:1.71 kA, X/R=1.32
LV SLG 2.30 kA, X/R=0.99
FU-FEED5-OH LINE
TRS100A
200kA@ 600 V
CBL-FEED5-OH LINE
1R(1 AWG, Copper)
160 ft
CBL-TX-7/8VA
1R(4 AWG, Copper)
100 ft
FU-TX-7/8VA
8A
58kA@ 0V
PRI-TX-7/8VA
LV 3P:2.48 kA, X/R=0.91
LV SLG 2.61 kA, X/R=0.67
TX-7/8VA
7/8 kVA
600/208 V
Z= 6.18 %
PNL-1-2 SPL
LV 3P:2.48 kA, X/R=2.03
LV SLG 2.74 kA, X/R=2.26
CBL-DISC-PNL-1
1R(3 AWG, Copper)
12 ft
CBL-DISC-PNL-2
1R(3 AWG, Copper)
20 ft
DISC-PNL-1
LV 3P:2.40 kA, X/R=1.82
LV SLG 2.37 kA, X/R=1.80
DISC-PNL-2
LV 3P:2.34 kA, X/R=1.70
LV SLG 2.46 kA, X/R=1.60
FU-PNL-1
CEN100A
10kA@ 250V
FU-PNL-2
CEN100A
10kA@ 250V
CBL-PNL-1
1R(3 AWG, Copper)
6 ft
CBL-PNL-2
1R(3 AWG, Copper)
6 ft
PNL-1
LV 3P:2.36 kA, X/R=1.72
LV SLG 2.40 kA, X/R=1.64
PNL-2
LV 3P:2.30 kA, X/R=1.62
LV SLG 2.37 kA, X/R=1.47
CB-PNL-1
NB100A
10kA@ 240V
CB-PNL-2
NB100A
10kA@ 240V
CBL-POLE-SINGLE PHASE
1R(1 AWG, Copper)
150 ft
POLE-SINGLE PHASE
LV 3Ph: 38 kA, X/R=0.35
LV SLG: 1.67 kA, X/R=0.41
CBL-MAIN DISC (SEACAN)
1R(1 AWG, Copper)
40 ft
MAIN DISC (SEACAN)
LV 3P:2.38 kA, X/R=0.80
LV SLG: 1.73 kA, X/R=0.59
FU-MAIN DISC (SEACAN)
NB100A
10kA@ 480V
CBL-125 A/3PL
1R(1 AWG, Copper)
5 ft
125 A/3PL
LV 3P:2.38 kA, X/R=0.80
LV SLG: 1.73 kA, X/R=0.59
CBL-DISC-TX-SEACAN TRANSFORMER
1R(4 AWG, Copper)
5 ft
DISC-TX-SEACAN TRANSFORMER
LV 3P:2.30 kA, X/R=0.77
LV SLG: 1.68 kA, X/R=0.57
FU-TX-SEACAN TRANSFORMER
NB100A
10kA@ 480V
CBL-TX-SEACAN TRANSFORMER
1R(6 AWG, Copper)
5 ft
PRITX-SEACAN TRANSFORMER
LV 3P2, 48 kA, X/R=0.75
LV SLG: 1.63 kA, X/R=0.55
TX-SEACAN TRANSFORMER
30 kVA
600/208 V
Z= 3.40 %
SEC TX-SEACAN TRANSFORMER
LV 3P1:.88 kA, X/R=1.66
LV SLG: 2.04 kA, X/R=2.03
CBL-SEACAN TRANSFORMER
1R(2 AWG, Copper)
12 ft
SEACAN TRANSFORMER
LV 3P1:.83 kA, X/R=1.73
LV SLG: 1.94 kA, X/R=1.79
CB-SEACAN TRANSFORMER
NB60A
10kA@ 240V

Table 3.1: Short Circuit

QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

Short Circuit Results Table
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Worst Case Short-Circuit
2025-12-31

		First Cycle Duties Summary								Interrupting (Contact-parting) Duties Summary			
		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
125A SPL	600	2563.98	0.80	1731.29	0.59								
A-SPL	208	3849.54	2.69	3987.77	2.75								
AC CONDENSER #2	600	3263.57	0.61	2113.68	0.39								
APU WAYSIDE	480	20388.80	2.41	18976.37	1.77								
BAGGAGE & COMMA-SIONRY	600	3246.23	0.58	2107.41	0.38								
BASEMENT MUA DH 6	600	4166.86	0.86	2873.43	0.56								
BIG AIR COMPRESSOR	480	5332.23	0.61	3340.38	0.40								
BKR-GARAGE BENCH GRINDER	600	2881.80	0.66	1918.04	0.44								
BRK #12	480	8826.46	1.13	6360.93	0.84								
BUNKHOUSE WAYSIDE	480	24226.38	3.77	25225.25	3.19								
CC WAYSIDE POWER	208	2521.35	1.12	2053.23	0.80								
COACH SHOP SWBD	480	7535.96	1.72	5402.44	1.30								
COMPRESSOR	480	6070.58	0.70	3894.91	0.47								
COMPRESSOR FUTURE	480	8045.67	1.01	5544.00	0.70								
COOKING MUA FAN #16	600	3285.60	0.61	2151.10	0.40								
COOKING MUA FAN #17	600	3285.60	0.61	2151.10	0.40								
CTB SPL	208	5395.72	1.88	4591.46	1.52								
DH 10 DUCT HEATER	600	3234.87	0.56	2103.29	0.37								
DISC-BIG AIR COMPRES-SOR	480	8000.63	0.92	5453.93	0.63								
DISC-BRK #12	480	9048.85	1.18	6582.19	0.87								
DISC-COMPRESSOR	480	7992.36	0.92	5450.85	0.63								
DISC-EF1	208	764.24	0.34	463.37	0.21								

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		First Cycle Duties Summary								Interrupting (Contact-parting) Duties Summary			
		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
DISC-EF2	208	860.20	0.38	526.85	0.23								
DISC-EF3	208	1051.56	0.39	654.80	0.24								
DISC-GARAGE DOOR	480	5263.50	0.51	3324.65	0.36								
DISC-MAIN MDP	600	5865.68	2.20	5327.98	1.71								
DISC-MAKEUP AIR	208	2336.75	0.86	1726.27	0.54								
DISC-OH CRANE	480	5805.54	0.87	3693.22	0.60								
DISC-OIL PUMP #1/2	480	3793.99	0.45	2297.90	0.32								
DISC-PIT JACK	480	1483.12	0.23	866.31	0.16								
DISC-PNL-1	208	2400.10	1.82	2570.11	1.80								
DISC-PNL-2	208	2340.31	1.70	2456.60	1.60								
DISC-TX-SEACAN TRANS-FORMER	600	2500.55	0.77	1678.35	0.57								
DISC-VENT FAN REPAIR SHOP	480	1492.82	0.24	868.78	0.16								
DM EAST END	480	1033.19	0.22	594.06	0.14								
DM WEST END	480	2130.58	0.28	1258.25	0.20								
DRILL PRESS	480	1760.47	0.22	1036.77	0.16								
DUCT HEATER #1	600	2638.39	0.46	1669.91	0.31								
DUCT HEATER #2	600	2638.39	0.46	1669.91	0.31								
EAST DOOR	208	543.24	0.23	326.14	0.14								
EAST END SPL	600	3705.40	1.32	2799.14	0.99								
EF1	208	687.19	0.32	413.45	0.19								
EF2	208	764.08	0.35	463.34	0.21								
EF3	208	911.26	0.35	559.35	0.21								
ELEVATOR	600	5742.57	1.33	4578.40	0.92								
FC2 FAN-COIL	600	3246.23	0.58	2107.41	0.38								

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Short Circuit Results Table
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		First Cycle Duties Summary								Interrupting (Contact-parting) Duties Summary			
		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
FUEL HOUSE SPL	480	7855.25	2.05	6529.88	1.52								
GARAGE BENCH GRINDER	600	2535.82	0.57	1643.74	0.38								
GARAGE DOOR	480	3504.58	0.34	2129.94	0.24								
HOT WATER TANK #1	600	6277.36	1.65	5293.47	1.17								
HOT WATER TANK #2	600	6277.36	1.65	5293.47	1.17								
HR	208	2717.30	1.14	2156.61	0.73								
JIB CRANE	480	1670.91	0.26	988.86	0.20								
LAUNDRY ROOM & HEATER	600	4109.77	0.69	2806.14	0.45								
LIFT DEVICE	480	894.14	0.16	521.04	0.11								
LOCO BATTERY CHARGER	480	2619.32	0.35	1569.62	0.27								
LP A	208	4201.51	1.51	3514.34	1.11								
LP A/K/J SPL	208	6716.27	3.19	7462.69	3.10								
LP B	600	5104.37	1.15	3877.12	0.80								
LP C	208	2024.31	0.94	1644.22	0.69								
LP D	208	2968.12	1.92	3098.85	1.89								
LP E	600	6636.88	2.65	5937.26	2.04								
LP F	208	3796.46	2.14	3783.87	1.82								
LP G	208	3845.66	2.18	3865.22	1.88								
LP H (RESTAURANT AREA)	600	6565.45	3.08	5934.04	2.53								
LP J	208	911.49	0.32	553.62	0.24								
LP K	208	5867.21	2.22	5880.84	1.74								
LP PANEL A	208	3041.43	1.38	2778.84	1.10								
LP-B	240	3378.92	1.64	2881.83	1.24								

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Short Circuit Results Table
Ontario Northland Cochrane Site
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2025-12-31

		First Cycle Duties Summary								Interrupting (Contact-parting) Duties Summary			
		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
LP-C/D SPL	208	3024.22	2.04	3200.91	2.11								
LP-F/G SPL	208	4107.33	2.46	4315.55	2.30								
LPI (COMMON AREA)	600	7359.52	3.41	7002.11	2.89								
MACHINE SHOP SPL	480	3267.26	0.37	1968.43	0.27								
MAIN BKR CSI	600	7590.50	3.79	7345.95	3.38								
MAIN DISC (SEACAN)	600	2584.72	0.80	1748.35	0.59								
MAIN PANEL CF	208	5034.05	1.19	3702.12	0.91								
MAIN SHOP PNL	240	3014.10	2.41	2564.84	2.04								
MAKEUP AIR	208	1962.54	0.71	1361.87	0.43								
MCC MAIN SHOPS	480	10878.45	2.62	8506.23	2.02								
MDP	600	4848.30	1.70	4016.49	1.27								
MOTEL AREA SPL	600	7359.52	3.41	7002.11	2.89								
MOTOR #2	480	799.48	0.15	465.31	0.11								
NEW PANEL FEED	208	3728.35	1.20	2924.49	0.86								
O/H DOOR E WALL	480	827.08	0.23	474.64	0.15								
O/H DOOR N WALL	480	1593.62	0.31	931.13	0.21								
O/H DOOR W WALL	480	2893.37	0.46	1736.71	0.33								
OH CRANE	480	3076.19	0.65	1810.69	0.40								
OIL PUMP #1/2	480	3293.39	0.40	1975.82	0.28								
OL PUMP SOUTH	480	5192.34	0.95	3558.01	0.63								
ONR AREA SPL	600	7440.71	3.58	7117.75	3.09								
OUTSIDE RIP PIT HEATERS	480	1231.23	0.18	723.90	0.14								
PANEL A	208	5199.22	1.79	4355.97	1.44								
PANEL A (CS)	208	3293.29	2.05	3082.44	1.71								

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Short Circuit Results Table
Ontario Northland Cochrane Site
ENK-25-16394
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2025-12-31

		First Cycle Duties Summary								Interrupting (Contact-parting) Duties Summary			
		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
PANEL B	208	5199.22	1.79	4355.97	1.44								
PANEL B (CS)	208	2732.77	1.64	2324.94	1.27								
PANEL B (PH)	480	11548.51	2.31	9449.94	1.82								
PANEL C (CS)	208	3765.07	2.57	3838.81	2.51								
PANEL FH	208	2173.65	2.64	2245.71	2.60								
PANEL J	208	1429.70	2.03	1431.95	1.86								
PANEL LPY	208	1832.74	1.09	1840.03	1.07								
PIT JACK	480	1397.66	0.23	815.37	0.16								
PNL-1	208	2355.16	1.72	2484.68	1.64								
PNL-1/2 SPL	208	2491.33	2.03	2743.81	2.26								
PNL-2	208	2296.17	1.62	2373.86	1.47								
POLE 13	25000	1586.06	3.14	1386.59	2.81	1732.28	3.12	1500.86	2.81	1539.00	3.12	1362.30	2.81
Pole 15	25000	1576.17	3.07	1375.34	2.77	1713.54	3.05	1484.13	2.77	1529.21	3.05	1351.18	2.77
Pole 16	25000	1567.75	3.02	1365.82	2.74	1697.89	3.00	1470.13	2.73	1520.87	3.00	1341.78	2.73
Pole 17	25000	1559.38	2.97	1356.40	2.70	1682.61	2.95	1456.44	2.70	1512.58	2.95	1332.47	2.70
POLE-SINGLE PHASE	600	1696.14	0.55	1074.20	0.41								
POWERHOUSE SWBD	480	13248.84	3.16	11459.69	2.62								
PP (C-H)	208	3483.56	0.71	2311.74	0.53								
PRI TX-75kVA (LP A/ CC WP)	480	6653.28	1.02	4467.72	0.77								
PRI TX-A	480	6952.90	1.49	4860.06	1.12								
PRI TX-HOTEL TRANS-FORMER	600	7253.18	3.15	6835.56	2.59								
PRI TX-ONR TRANS-FORMER	600	4723.68	0.94	3429.64	0.64								
PRI TX-PANEL FH	480	7542.94	1.85	6137.50	1.35								

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		First Cycle Duties Summary								Interrupting (Contact-parting) Duties Summary			
		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
PRI TX-SEACAN TRANS-FORMER	600	2439.60	0.75	1628.22	0.55								
PRI TX-T-3 SPL	480	12355.08	2.65	10382.39	2.12								
PRI TX-WAYSIDE	25000	1575.55	3.07	1374.55	2.76	1712.34	3.05	1482.69	2.76	1528.62	3.05	1350.43	2.76
PRI TX-Y	480	2399.46	0.30	1432.16	0.23								
PRI-TX-75kVA	600	2888.49	0.91	2007.13	0.67								
PRI-TX-LP-F/G	600	5957.32	2.01	5053.56	1.50								
PRI-TX-PANEL J	600	4801.21	1.09	3571.10	0.76								
PRI-TX-UP1	600	1746.61	0.37	1081.91	0.25								
PRI-TX-UP2	600	1627.29	0.39	1006.85	0.27								
RF PUMP SOUTH	480	5204.78	0.97	3563.06	0.63								
RHU SPL	480	5614.19	1.01	3580.42	0.68								
RIP PLUG	480	6402.59	1.21	4377.48	0.94								
RISER POLE	25000	1574.05	3.06	1373.23	2.76	1710.46	3.04	1481.38	2.76	1527.58	3.04	1349.35	2.76
ROLLUP DOOR	208	543.24	0.23	326.14	0.14								
SEACAN TRANSFORMER	208	1825.03	1.73	1944.82	1.79								
SEC TX-75kVA (LP A/ CC WP)	208	3852.04	2.28	4149.70	2.48								
SEC TX-A	208	3882.59	2.71	4050.44	2.84								
SEC TX-CF	208	10938.09	3.21	11139.59	3.19								
SEC TX-CSI	600	8500.91	4.46	8790.78	4.53								
SEC TX-CTB	208	7746.10	2.97	7850.89	2.97								
SEC TX-CYO	600	7264.71	3.66	7499.84	3.63								
SEC TX-HOTEL TRANS-FORMER	208	6799.88	3.31	7625.93	3.33								

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		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
SEC TX-ONR TRANS-FORMER	208	3096.04	2.14	3329.08	2.32								
SEC TX-PANEL FH	208	2207.84	2.76	2304.00	2.81								
SEC TX-SEACAN TRANS-FORMER	208	1876.34	1.84	2039.36	2.03								
SEC TX-T-3 SPL	240	2806.34	3.09	2916.61	3.11								
SEC TX-WAYSIDE	480	27030.04	5.06	30333.43	5.49								
SEC TX-Y	208	2114.33	1.32	2348.01	1.58								
SEC-T-1	480	11532.90	3.77	11951.73	3.81								
SEC-TX-LP-F/G	208	4336.53	2.78	4731.63	2.87								
SEC-TX-PANEL J	208	1497.48	2.41	1549.86	2.50								
SEC-TX-T2	480	15943.78	3.83	16094.41	3.93								
SEC-TX-T3	240	4498.81	3.31	4540.49	3.32								
SEC-TX-UP1	208	517.88	2.01	530.96	2.14								
SEC-TX-UP2	208	967.92	1.80	1020.74	2.01								
SECOND LATHE	480	3349.18	0.50	2039.04	0.38								
SMALL AIR COMP.	480	3456.93	0.36	2084.88	0.24								
SOUTH DOOR	208	543.24	0.23	326.14	0.14								
SPL LP A/ CC WP	208	3772.83	2.22	4007.12	2.34								
SPL PANEL BTW TRACKS #3&4	480	6669.96	1.04	4473.60	0.78								
SS-OFFLOAD PUMP-L	480	6366.94	1.26	4707.02	0.86								
SS-OFFLOAD PUMP-N	480	6366.94	1.26	4707.02	0.86								
SS-REFUEL PUMP-L	480	6374.71	1.27	4710.77	0.86								
SS-REFUEL PUMP-N	480	6374.70	1.27	4710.77	0.86								
SS-T-2-L	480	14441.62	3.41	13388.46	3.04								

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		First Cycle Duties Summary								Interrupting (Contact-parting) Duties Summary			
		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
SS-T-2-N	480	14441.63	3.41	13388.47	3.04								
SUMP PUMP 1/2	208	1074.57	0.47	662.20	0.25								
T-1 DIP POLE	480	9337.36	2.01	8298.69	1.44								
T-3 SPL	240	3940.95	2.83	3719.15	2.54								
THUNDER DOME PANEL	208	1226.70	0.63	811.28	0.46								
TRACK #1 EE	480	812.70	0.18	466.90	0.12								
TRACK #2 EE	480	812.70	0.18	466.90	0.12								
TRACK #3 EE	480	812.70	0.18	466.90	0.12								
TRACK #3 WE	480	1498.98	0.21	878.30	0.15								
TRACK #4 EE	480	812.70	0.18	466.90	0.12								
TRACK #4 WE	480	1498.98	0.21	878.30	0.15								
TRACK1 WAYSIDE	480	25931.96	4.56	28250.55	4.40								
TRACK2 WAYSIDE	480	22984.03	2.83	22909.78	2.13								
TRACK3 WAYSIDE	480	20957.71	2.32	19661.88	1.68								
TRACK4 WAYSIDE	480	14852.18	2.02	12238.51	1.52								
TS-3-N	240	4012.50	2.99	3823.91	2.76								
TS-T-3-E	240	2764.60	2.97	2846.48	2.89								
TS-T-3-L	240	4012.50	2.99	3823.91	2.76								
UP1	208	512.73	1.94	522.24	2.00								
UP2	208	958.65	1.76	1004.70	1.93								
UTILITY - CF	24900	1678.30	4.41	1532.20	3.59	2042.52	4.41	1778.59	3.59	1678.30	4.41	1532.20	3.59
UTILITY - CSI	24900	1570.50	3.30	1395.42	2.91	1782.28	3.30	1544.55	2.91	1564.40	3.30	1392.20	2.91
UTILITY - CTB	24900	1613.10	3.69	1450.70	3.15	1884.20	3.69	1636.22	3.15	1613.10	3.69	1450.70	3.15
UTILITY - CYO	24900	1778.55	4.42	1667.94	5.65	2164.75	4.42	2146.97	5.65	1777.80	4.42	1667.50	5.65
VENT FAN REPAIR SHOP	480	1009.23	0.20	582.19	0.13								

QUALUS SERVICES CANADA LTD.
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Short Circuit Results Table
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Worst Case Short-Circuit
2025-12-31

		First Cycle Duties Summary								Interrupting (Contact-parting) Duties Summary			
		Low Voltage Duties				MV\HV Duties							
		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault		3-Phase Fault		Single Line to Ground Fault	
Fault Location Bus Name	Bus Voltage (V)	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Asym. RMS (Amps) @ 0.5 Cycles	X/R	Sym. RMS (Amps)	X/R	Sym. RMS (Amps)	X/R
VENT FANS SERVICE SHOP	480	1055.79	0.36	567.23	0.15								
VFSS #1	480	800.27	0.27	431.30	0.12								
VFSS #2	480	800.27	0.27	431.30	0.12								
VFSS #3	480	800.27	0.27	431.30	0.12								
VFSS #4	480	800.27	0.27	431.30	0.12								
WALKWAY DUCT HEATER #3	600	2638.39	0.46	1669.91	0.31								
WAYSIDE SWBD	480	26989.01	5.02	30206.88	5.34								
WELD OUTLET R1	480	5914.60	1.08	3959.26	0.82								
WELD OUTLET R2	480	4752.51	0.82	3055.83	0.63								
WELD OUTLET R3	480	3809.97	0.66	2383.64	0.51								
WELD OUTLET R4	480	3160.92	0.56	1945.72	0.44								
WELD OUTLET R5	480	2891.46	0.53	1768.96	0.41								
WELD OUTLET R6	480	3639.25	0.63	2266.67	0.49								
WELD OUTLET R7	480	4581.90	0.79	2930.56	0.61								
WELDER PLUG #1	480	2466.88	0.35	1479.37	0.27								
WELDER PLUG #2	480	3582.05	0.45	2189.17	0.35								
WEST DOOR	208	543.24	0.23	326.14	0.14								
WHITING JACKS ED PLUG	480	2210.66	0.33	1319.10	0.25								
WHITING JACKS PLUG	480	1561.27	0.25	922.61	0.19								

3.4 Protective Devices Evaluation

Electrical distribution equipment must be able to withstand and/or interrupt the most severe fault duty that it may be subjected to at its location in the system. In particular OESC Section 14-012 [2] , requires circuit breakers to have a rating sufficient for interrupting the maximum available short-circuit fault current present at their line side terminals. For locations where calculated short-circuit fault currents exceed the ratings of equipment, recommendations for remedies are provided. The interrupting ratings of the overcurrent protective devices under this study was checked against the short circuit results to determine its adequacy to interrupt the fault current. The results of the protection devices evaluation analysis are listed in Table 3.2.

The results of the protection devices evaluation analysis are listed in the Protection Devices Evaluation Results table shown below. Listed in the table are the calculated “INTERRUPTING” and “MOMENTARY (CLOSE-LATCH)” duties at each piece of equipment. The equipment “INTERRUPTING” and “MOMENTARY (CLOSE-LATCH)” ratings are also shown in the table. The calculated result values are compared with the respective device rating values.

Table 3.2: Protective Devices Evaluation

QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

Protective Devices Evaluation Table
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Utility Delivering Maximum Available Short-Circuit Current
2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
A-SPL	FU-PANEL A (CS)	LITTELFUSE	NLN	208	250	200	3.99	50	Pass	7.98				
A-SPL	FU-PANEL B (CS)	LITTELFUSE	NLN	208	250	100	3.99	50	Pass	7.98				
A-SPL	FU-PANEL C (CS)	GOULD SHAWMUT	NRN, 200A	208	250	200	3.99	10	Pass	39.88				
BKR-GARAGE BENCH GRINDER	CB-BKR-GARAGE BENCH GRINDER	FPE	CE-E	600	600	15	2.88	18	Pass	16.01				
CC WAYSIDE POWER	CB-EAST DOOR	CUTLER-HAMMER	BR	208	240	20 / 15	2.54	10	Pass	25.39				
CC WAYSIDE POWER	CB-MAIN CC WAYSIDE POWER	SQUARE D	QOB	208	240	100	2.54	10	Pass	25.39				
CC WAYSIDE POWER	CB-ROLLUP DOOR	CUTLER-HAMMER	BR	208	240	20 / 15	2.54	10	Pass	25.39				
CC WAYSIDE POWER	CB-SOUTH DOOR	CUTLER-HAMMER	BR	208	240	20 / 15	2.54	10	Pass	25.39				
CC WAYSIDE POWER	CB-WEST DOOR	CUTLER-HAMMER	BR	208	240	20 / 15	2.54	10	Pass	25.39				
COACH SHOP SWBD	FU-JIB CRANE	GOULD SHAWMUT	A4J	480	600	30	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-MAIN COACH SHOP SWBD	LITTELFUSE	JTD	480	600	400	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-O/H DOOR E WALL	GOULD SHAWMUT	A4J	480	600	30	7.54	200	Pass	3.77				

QUALUS SERVICES CANADA LTD.
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Protective Devices Evaluation Table

Ontario Northland Cochrane Site

ENK-25-16394

Scenario: Utility Delivering Maximum Available Short-Circuit Current

2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
COACH SHOP SWBD	FU-O/H DOOR N WALL	GOULD SHAWMUT	A4J	480	600	30	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-O/H DOOR W WALL	GOULD SHAWMUT	A4J	480	600	30	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-TX-A	LITTELFUSE	NLN	480	250	100	7.54	50	Fail	15.07				
COACH SHOP SWBD	FU-WELD OUTLET R1	GOULD SHAWMUT	A4J	480	600	100	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-WELD OUTLET R2	GOULD SHAWMUT	A4J	480	600	100	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-WELD OUTLET R3	GOULD SHAWMUT	A4J	480	600	30	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-WELD OUTLET R4	GOULD SHAWMUT	A4J	480	600	100	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-WELD OUTLET R5	GOULD SHAWMUT	A4J	480	600	100	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-WELD OUTLET R6	GOULD SHAWMUT	A4J	480	600	100	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-WELD OUTLET R7	GOULD SHAWMUT	A4J	480	600	100	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-WHITING JACKS ED PLUG	FERRAZ SHAWMUT	AJT	480	600	30	7.54	200	Pass	3.77				
COACH SHOP SWBD	FU-WHITING JACKS PLUG	LITTELFUSE	JTD	480	600	30	7.54	200	Pass	3.77				
CTB SPL	FU-MAIN CTB SPL	GOULD SHAWMUT	OTS	208	600	300	5.40	50	Pass	10.79				

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Protective Devices Evaluation Table
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Utility Delivering Maximum Available Short-Circuit Current
2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
DISC-BIG AIR COMPRESSOR	FU-BIG AIR COMPRESSOR	EDISON	ECSR45	480	600	45	8.00	200	Pass	4.00				
DISC-BRK #12	FU-BRK #12	FERRAZ SHAWMUT	AJT	480	600	30	9.05	200	Pass	4.52				
DISC-COMPRESSOR	FU-COMPRESSOR	GOULD SHAWMUT	AJT	480	600	50	7.99	200	Pass	4.00				
DISC-GARAGE DOOR	FU-GARAGE DOOR	FERRAZ SHAWMUT	AJT	480	600	15	5.26	200	Pass	2.63				
DISC-MAIN MDP	FU-DISC-MAIN MDP	GOULD SHAWMUT	TRS	600	600	200	6.02	200	Pass	3.01				
DISC-OH CRANE	FU-OH CRANE	LITTELFUSE	FLSR	480	600	60	5.81	200	Pass	2.90				
DISC-PIT JACK	FU-PIT JACK	BUSSMANN	KTS-R	480	600	30	1.48	200	Pass	0.74				
DISC-PNL-1	FU-PNL-1	GOULD SHAWMUT	CRN	208	250	100	2.57	10	Pass	25.70				
DISC-PNL-2	FU-PNL-2	GOULD SHAWMUT	CRN	208	250	100	2.46	10	Pass	24.64				
DISC-TX-SEA-CAN TRANSFORMER	FU-TX-SEA-CAN TRANSFORMER	GOULD SHAWMUT	NRS	600	600	40	2.50	10	Pass	25.01				
DISC-VENT FAN REPAIR SHOP	FU-VENT FAN REPAIR SHOP	GOULD SHAWMUT	TRS	480	600	15	1.49	200	Pass	0.75				
DM EAST END	FU-TRACK #1 EE	ENGLISH ELECTRIC	6A	480	600	6	1.03	200	Pass	0.52				
DM EAST END	FU-TRACK #2 EE	ENGLISH ELECTRIC	6A	480	600	6	1.03	200	Pass	0.52				

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Protective Devices Evaluation Table
Ontario Northland Cochrane Site
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Scenario: Utility Delivering Maximum Available Short-Circuit Current
2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
DM EAST END	FU-TRACK #3 EE	ENGLISH ELECTRIC	6A	480	600	6	1.03	200	Pass	0.52				
DM EAST END	FU-TRACK #4 EE	ENGLISH ELECTRIC	6A	480	600	6	1.03	200	Pass	0.52				
DM WEST END	FU-TRACK #3 WE	ENGLISH ELECTRIC	6A	480	600	6	2.13	200	Pass	1.07				
DM WEST END	FU-TRACK #4 WE	ENGLISH ELECTRIC	20A	480	600	20	2.13	200	Pass	1.07				
EAST END SPL	FU-FEEDS OH LINE	GOULD SHAWMUT	TRS	600	600	100	3.71	200	Pass	1.85				
FUEL HOUSE SPL	FU-FUEL HOUSE	LITTELFUSE	NLS	480	600	300	7.86	50	Pass	15.73				
FUEL HOUSE SPL	FU-SS-OF-FLOAD PUMP-L	BUSSMANN	FRS-R	480	600	40	7.86	200	Pass	3.93				
FUEL HOUSE SPL	FU-SS-RE-FUEL PUMP-L	GOULD SHAWMUT	TRS	480	600	40	7.86	200	Pass	3.93				
FUEL HOUSE SPL	FU-TX-PANEL FH	BUSSMANN	FRS-R	480	600	80	7.86	200	Pass	3.93				
JIB CRANE	FU-MAIN JIB CRANE	BUSSMANN	FRS-R	480	600	25	1.67	200	Pass	0.84				
LIFT DEVICE	FU-MOTOR #2	LITTELFUSE	FLSR	480	600	10	0.89	200	Pass	0.45				
LP A	CB-MAIN LP A	FPE	225	208	240	225 / 200	4.26	10	Pass	42.64				
LP A	CB-NEW PANEL FEED	FEDERAL PIONEER	NB	208	240	100	4.26	10	Pass	42.64				
LP A/K/J SPL	FU-LP A	GOULD SHAWMUT	AJT	208	600	150	7.46	200	Pass	3.73				

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Protective Devices Evaluation Table
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Utility Delivering Maximum Available Short-Circuit Current
2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
LP A/K/J SPL	FU-LP J	GOULD SHAWMUT	CJ	208	600	100	7.46	200	Pass	3.73				
LP A/K/J SPL	FU-LP K	BUSSMANN	JCL	208	600	200 / 150	7.46	200	Pass	3.73				
LP B	CB-DUCT HEATER #1	f.p.e	CHED	600	600	50 / 15	5.10	18	Pass	28.36				
LP B	CB-DUCT HEATER #2	f.p.e	CHED	600	600	50 / 15	5.10	18	Pass	28.36				
LP B	CB-MAIN LP B	f.p.e	CHED	600	600	150 / 100	5.10	18	Pass	28.36				
LP B	CB-WALK-WAY DUCT HEATER #3	f.p.e	CHED	600	600	50 / 15	5.10	18	Pass	28.36				
LP C	CB-LP C	FEDERAL PIONEER	NB	208	240	100 / 70	2.04	10	Pass	20.37				
LP D	CB-LP D	FEDERAL PIONEER	NB	208	240	100	3.16	10	Pass	31.62				
LP D	CB-LP D BRANCH	FEDERAL PIONEER	NB	208	240	100 / 40	3.16	10	Pass	31.62				
LP E	CB-AC CONDENSER #2	f.p.e	CHED	600	600	50 / 20	6.73	18	Pass	37.41				
LP E	CB-BAGGAGE & COMMASIONRY	f.p.e	CHED	600	600	50 / 15	6.73	18	Pass	37.41				
LP E	CB-BASEMENT MUA DH 6	f.p.e	CHED	600	600	50 / 30	6.73	18	Pass	37.41				
LP E	CB-DH 10 DUCT HEATER	f.p.e	CHED	600	600	50 / 15	6.73	18	Pass	37.41				

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Protective Devices Evaluation Table
Ontario Northland Cochrane Site
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Scenario: Utility Delivering Maximum Available Short-Circuit Current
2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
LP E	CB-FC2 FAN-COIL	f.p.e	CHED	600	600	50 / 15	6.73	18	Pass	37.41				
LP E	CB-MAIN LP E			600	0	0	6.73		Unknown					
LP F	CB- LP F BRANCH #1	FEDERAL PIONEER	NB	208	240	100 / 60	4.11	10	Pass	41.15				
LP F	CB-LP F	FPE	125	208	240	125	4.13	10	Pass	41.26				
LP G	CB- LP G BRANCH #1	FEDERAL PIONEER	NB	208	240	100 / 40	4.20	10	Pass	42.01				
LP G	CB-LP G	FPE	225	208	240	225 / 150	4.21	10	Pass	42.12				
LP H (RESTAURANT AREA)	CB-COOKING MUA FAN #16	f.p.e	CHED	600	600	50 / 15	6.57	18	Pass	36.47				
LP H (RESTAURANT AREA)	CB-KITCHEN EXHOUST FAN #17	f.p.e	CHED	600	600	50 / 15	6.57	18	Pass	36.47				
LP H (RESTAURANT AREA)	CB-MAIN LP H (RESTAURANT AREA)	FPE	CJL-E	600	600	400 / 300	6.57	25	Pass	26.26				
LP H (RESTAURANT AREA)	CB-TX-LP-F/G	f.p.e	CHED	600	600	150 / 90	6.57	18	Pass	36.47				
LP H (RESTAURANT AREA)	CB-TX-PANEL J	FEDERAL PIONEER	CE-B	600	600	40	6.57	14	Pass	46.90				
LP J	CB-LP J BRANCH	FEDERAL PIONEER	NB	208	240	100 / 20	0.91	10	Pass	9.11				
LP J	CB-MAIN LP J	FPE	125	208	240	125 / 100	0.91	10	Pass	9.11				
LP K	CB-LP K BRANCH	FEDERAL PIONEER	NB	208	240	100 / 30	6.53	10	Pass	65.26				

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Protective Devices Evaluation Table
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Utility Delivering Maximum Available Short-Circuit Current
2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
LP K	CB-MAIN LP K	FPE	225	208	240	225 / 150	6.54	10	Pass	65.43				
LP PANEL A	CB-LP PANEL A BRANCH #1	SQUARE D	QOB	208	240	30	3.15	10	Pass	31.45				
LP PANEL A	CB-MAIN LP PANEL A	SQUARE D	QOB	208	240	100	3.15	10	Pass	31.45				
LP-C/D SPL	FU-LP C	BUSSMANN	JCL	208	600	100 / 70	3.20	200	Pass	1.60				
LP-C/D SPL	FU-LP D	BUSSMANN	JCL	208	600	100	3.20	200	Pass	1.60				
LPI (COMMON AREA)	CB-ELEVATOR	f.p.e	CHED	600	600	50	7.45	18	Pass	41.41				
LPI (COMMON AREA)	CB-HOT WATER TANK #1	GE	THED	600	600	80 / 60	7.50	18	Pass	41.65				
LPI (COMMON AREA)	CB-HOT WATER TANK #2	GE	THED	600	600	80 / 60	7.50	18	Pass	41.65				
LPI (COMMON AREA)	CB-MAIN LPI (COMMON AREA)			600	0	0	7.45		Unknown					
MACHINE SHOP SPL	FU-DISC-DRILL PRESS	BUSSMANN	HRCI-CB	480	600	6	3.27	200	Pass	1.63				
MAIN BKR CSI	CB-LP H (RESTAURANT AREA)	FPE	CJL-E	600	600	400 / 300	7.65	25	Pass	30.61				
MAIN BKR CSI	CB-LPI (COMMON AREA)	FPE	CF	600	600	250 / 200	7.95	18	Pass	44.15				
MAIN BKR CSI	CB-MAIN CSI	FEDERAL PACIFIC	NM	600	600	800	7.65	35	Pass	21.87				
MAIN BKR CSI	CB-MOTEL AREA	FPE	CF	600	600	250 / 200	7.95	18	Pass	44.15				
MAIN BKR CSI	CB-ONR AREA	FPE	CF	600	600	250 / 225	7.95	18	Pass	44.15				

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Protective Devices Evaluation Table
Ontario Northland Cochrane Site
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Scenario: Utility Delivering Maximum Available Short-Circuit Current
2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
MAIN DISC (SEACAN)	FU-MAIN DISC (SEACAN)	GOULD SHAWMUT	NRS	600	600	60	2.58	10	Pass	25.85				
MAIN PANEL CF	CB-PP (C-H)	federal pioneer	NH	208	240	100 / 60	5.03	10	Pass	50.34				
MAIN PANEL CF	FU-MAIN PANEL CF	GOULD SHAWMUT	CRN	208	250	200	5.03	10	Pass	50.34				
MAIN SHOP PNL	CB-MAIN SHOP PNL	EATON	CLD	240	240	600	3.01	65	Pass	4.64				
MAIN SHOP PNL	CB-PANEL E (MS PNL)	EATON/CUTLER-HAMMER	HFD	240	240	100	3.01	100	Pass	3.01				
MAIN SHOP PNL	CB-SPARE (MS PNL)	EATON/CUTLER-HAMMER	HFD	240	240	200	3.01	100	Pass	3.01				
MCC MAIN SHOPS	CB-DISC-OH CRANE	EATON/CUTLER-HAMMER	HFD	480	480	60	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-DISC-OIL PUMP #1/2	EATON/CUTLER-HAMMER	HFD	480	480	30	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-DISC-PIT JACK	EATON/CUTLER-HAMMER	HFD	480	480	30	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-DISC-VENT FAN REPAIR SHOP	EATON/CUTLER-HAMMER	HFD	480	480	30	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-DM EAST END	EATON/CUTLER-HAMMER	HFD	480	480	30	10.88	65	Pass	16.74				

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Protective Devices Evaluation Table
Ontario Northland Cochrane Site
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Scenario: Utility Delivering Maximum Available Short-Circuit Current
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Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
MCC MAIN SHOPS	CB-DM WEST END	EATON/CUTLER-HAMMER	HFD	480	480	30	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-MACHINE SHOP SPL	EATON/CUTLER-HAMMER	HFD	480	480	15	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-MAIN MCC MAIN SHOPS	EATON	HLD	480	480	600	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-OUTSIDE RIP PIT HEATERS	EATON/CUTLER-HAMMER	HFD	480	480	30	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-RHU SPL	EATON/CUTLER-HAMMER	HFD	480	480	100	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-RIP PLUG	EATON/CUTLER-HAMMER	HFD	480	480	100	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-SPL PANEL BTW TRACKS #3&4	EATON/CUTLER-HAMMER	HFD	480	480	60	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-TX-75kVA (LP A/ CC WP)	EATON/CUTLER-HAMMER	HFD	480	480	125	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-TX-Y	EATON/CUTLER-HAMMER	HFD	480	480	60	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-VENT FANS SERVICE SHOP	EATON/CUTLER-HAMMER	HFD	480	480	30	10.88	65	Pass	16.74				

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Protective Devices Evaluation Table
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2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
MCC MAIN SHOPS	CB-WELDER PLUG #1	EATON/CUTLER-HAMMER	HFD	480	480	60	10.88	65	Pass	16.74				
MCC MAIN SHOPS	CB-WELDER PLUG #2	EATON/CUTLER-HAMMER	HFD	480	480	60	10.88	65	Pass	16.74				
MDP	CB-15KVA OFFICE TX	FPE	CE-E	600	600	15	4.87	18	Pass	27.06				
MDP	CB-BUILDING PANEL TX	FPE	CE-E	600	600	40	4.87	18	Pass	27.06				
MDP	CB-EAST END SPL	FPE	CE-E	600	600	200	4.87	18	Pass	27.06				
MDP	CB-GARAGE BENCH GRINDER	FPE	CE-E	600	600	15	4.87	18	Pass	27.06				
MDP	CB-MAIN MDP	FPE	CJL-E	600	600	400	4.87	25	Pass	19.48				
MOTEL AREA SPL	CB-LAUNDRY ROOM & HEATER	GOULD SHAWMUT	NRS	600	600	15	7.45	10	Pass	74.53				
MOTEL AREA SPL	FU-LP B	BUSSMANN	JCL	600	600	100	7.45	200	Pass	3.73				
MOTEL AREA SPL	FU-TX-HOTEL TRANSFORMER	BUSSMANN	JCL	600	600	200 / 125	7.45	200	Pass	3.73				
ONR AREA SPL	FU-LP E	DORMAN SMITH	SJ200	600	600	200	7.52	200	Pass	3.76				
ONR AREA SPL	FU-TX-ONR TRANSFORMER	BUSSMANN	JCL	600	600	60 / 35	7.52	200	Pass	3.76				

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Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
OUTSIDE RIP PIT HEATERS	FU-OUTSIDE RIP PIT HEATERS # 1			480	0	0	1.23		Unknown					
OUTSIDE RIP PIT HEATERS	FU-OUTSIDE RIP PIT HEATERS # 2			480	0	0	1.23		Unknown					
PANEL A	CB-PANEL A BRANCH #1	SQUARE D	QOB	208	240	15	5.24	10	Pass	52.43				
PANEL A	CB-PANEL A BRANCH #2	SQUARE D	QOB	208	240	40	5.24	10	Pass	52.43				
PANEL A	FU-PANEL A	Cefco	OT	208	250	200	5.20	50	Pass	10.40				
PANEL A (CS)	CB-DISC-EF3	CUTLER-HAMMER	BR	208	240	20 / 15	3.44	10	Pass	34.41				
PANEL A (CS)	CB-DISC-SUMP PUMP 1/2	CUTLER-HAMMER	BR	208	240	20 / 15	3.44	10	Pass	34.41				
PANEL A (CS)	CB-DISC-THUNDER DOME PANEL	CUTLER-HAMMER	BR	208	240	100	3.44	10	Pass	34.41				
PANEL B	CB-REC RM HEAT	SQUAR1	QOB	208	240	20	5.24	10	Pass	52.43				
PANEL B	FU-PANEL B	GOULD SHAWMUT	OTS	208	600	200	5.20	50	Pass	10.40				
PANEL B (CS)	CB-DISC-EF1	CUTLER-HAMMER	BR	208	240	20 / 15	2.74	10	Pass	27.41				
PANEL B (CS)	CB-DISC-EF2	CUTLER-HAMMER	BR	208	240	20 / 15	2.74	10	Pass	27.41				
PANEL B (PH)	CB-DISC-BRK #12	FEDERAL PACIFIC	NEF	480	480	100 / 30	11.55	18	Pass	64.16				

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Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
PANEL B (PH)	CB-DISC-GARAGE DOOR	FEDERAL PACIFIC	NEF	480	480	100 / 15	11.55	18	Pass	64.16				
PANEL B (PH)	CB-NEW AIR COMP.	FEDERAL PACIFIC	NEF	480	480	100 / 50	11.55	18	Pass	64.16				
PANEL B (PH)	CB-SMALL COMP.	FEDERAL PACIFIC	NEF	480	480	100 / 30	11.55	18	Pass	64.16				
PANEL B (PH)	CB-SUPPORT SERVICES	FEDERAL PACIFIC	NEF	480	480	100 / 15	11.55	18	Pass	64.16				
PANEL B (PH)	CB-WELDER OUTLET	FEDERAL PACIFIC	NEF	480	480	100 / 60	11.55	18	Pass	64.16				
PANEL C (CS)	CB-DISC-MAKEUP AIR	CUTLER-HAMMER	BR	208	240	40 / 30	4.25	10	Pass	42.45				
PANEL C (CS)	CB-HR	CUTLER-HAMMER	BR	208	240	40	4.25	10	Pass	42.45				
PANEL FH	CB-PANEL FH	EATON/CUTLER-HAMMER	EDB	208	240	225 / 200	2.25	22	Pass	10.21				
PANEL FH	CB-PANEL FH BRANCH	CUTLER-HAMMER	BR	208	240	60	2.51	10	Pass	25.07				
PANEL J	CB-CU-2 BOTTOM CONDENSER	CUTLER-HAMMER	BR	208	240	60	1.52	10	Pass	15.19				
PANEL J	CB-MUA-1	CUTLER-HAMMER	BR	208	240	20 / 15	1.52	10	Pass	15.19				
PANEL LPY	CB-RANGE	CUTLER-HAMMER	BR	208	240	40	1.85	10	Pass	18.53				
PNL-1	CB-PNL-1	FEDERAL PIONEER	NB	208	240	100 / 30	2.48	10	Pass	24.85				

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Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
PNL-2	CB-PNL-2	FEDERAL PIONEER	NB	208	240	100 / 20	2.43	10	Pass	24.27				
Pole 15	FU-TX-WAYSIDE	S&C	Positrol, 65N	25000	14400	65	1.53	7	Fail	21.54		1.71	10.00	17.14
Pole 16	FU-TX-T3	AB CHANCE	M8K	25000	36000	8	1.52		Unknown			1.70	0.00	0.00
Pole 17	FU-TX-T2	AB CHANCE	M10K	25000	36000	10	1.51		Unknown			1.68	0.00	0.00
POWERHOUSE SWBD	CB-COACH SHOP SWBD	EATON	HKD	480	480	400	13.25	65	Pass	20.38				
POWERHOUSE SWBD	CB-COMPRESSOR 10HP	EATON/CUTLER-HAMMER	HFD	480	480	30	13.25	65	Pass	20.38				
POWERHOUSE SWBD	CB-COMPRESSOR FUTURE	EATON/CUTLER-HAMMER	HFD	480	480	70	13.25	65	Pass	20.38				
POWERHOUSE SWBD	CB-DISC-BIG AIR COMPRESSOR	EATON/CUTLER-HAMMER	HFD	480	480	60	13.25	65	Pass	20.38				
POWERHOUSE SWBD	CB-DISC-COMPRESSOR 25HP	EATON/CUTLER-HAMMER	HFD	480	480	60	13.25	65	Pass	20.38				
POWERHOUSE SWBD	CB-MCC MAIN SHOPS	EATON	LGH	480	480	630	13.25	65	Pass	20.38				
POWERHOUSE SWBD	CB-PANEL B (PH)	EATON/CUTLER-HAMMER	HFD	480	480	200	13.25	65	Pass	20.38				
POWERHOUSE SWBD	CB-POWERHOUSE SWBD	EATON	NGS	480	480	800	13.25	50	Pass	26.50				

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Protective Devices Evaluation Table
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Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
POWER-HOUSE SWBD	CB-TRANS-FORMER XFER SWITCH	EATON/CUT-LER-HAM-MER	HFD	480	480	200	13.25	65	Pass	20.38				
PP (C-H)	CB-PP (C-H) BRANCH	EATON/CUT-LER-HAM-MER	BAB	208	240	40	3.48	10	Pass	34.84				
PRI TX-75kVA (LP A/ CC WP)	FU-TX-75kVA (LP A/ CC WP)	GOULD SHAWMUT	TRS	480	600	90	6.65	200	Pass	3.33				
PRI-TX-75kVA	FU-TX-75kVA			600	0	0	2.89		Unknown					
RISER POLE	FU-T-1	AB CHANCE	M8K	25000	36000	8	1.53		Unknown			1.71	0.00	0.00
SEACAN TRANS-FORMER	CB-SEA-CAN TRANS-FORMER	CUTLER-HAMMER	BR	208	240	40 / 30	1.96	10	Pass	19.60				
SPL LP A/ CC WP	FU-CC WAY-SIDE POWER	GOULD SHAWMUT	TRS	208	600	100	4.01	200	Pass	2.00				
SPL LP A/ CC WP	FU-LP PANEL A	GOULD SHAWMUT	TRS	208	600	100	4.01	200	Pass	2.00				
SPL LP A/ CC WP	FU-SPL LP A/ CC WP	GOULD SHAWMUT	TR	208	250	200	4.01	200	Pass	2.00				
SPL PANEL BTW TRACKS #3&4	FU-LIFT DE-VICE	LITTELFUSE	FLSR	480	600	10	6.67	200	Pass	3.33				
SPL PANEL BTW TRACKS #3&4	FU-LOCO BATTERY CHARGER	GOULD SHAWMUT	AJT	480	600	30	6.67	200	Pass	3.33				
SPL PANEL BTW TRACKS #3&4	FU-SECOND LATHE	GOULD SHAWMUT	AJT	480	600	60	6.67	200	Pass	3.33				

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Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
T-3 SPL	FU-LP-B	LITTELFUSE	FLSR	240	600	100	3.94	200	Pass	1.97				
T-3 SPL	FU-MAIN SHOP PNL	GOULD SHAWMUT	TRS	240	600	400	3.94	200	Pass	1.97				
THUNDER DOME PANEL	CB-THUNDER DOME PANEL	CUTLER-HAMMER	BR	208	240	100	1.23	10	Pass	12.27				
THUNDER DOME PANEL	CB-THUNDER DOME PANEL BRANCH	CUTLER-HAMMER	BR	208	240	60	1.23	10	Pass	12.27				
TS-3-N	CB-TS-3-N	EATON/CUTLER-HAMMER	KD	240	240	400	4.01	65	Pass	6.17				
UP1	CB-MAIN UP1	FEDERAL PIONEER	NB	208	240	100 / 60	0.54	10	Pass	5.41				
UP1	CB-UP 1 BRANCH #1	FEDERAL PIONEER	NB	208	240	100 / 30	0.54	10	Pass	5.41				
UP2	CB-MAIN UP2	FEDERAL PIONEER	NB	208	240	100	1.03	10	Pass	10.33				
UP2	CB-UP 2 BRANCH #1	FEDERAL PIONEER	NB	208	240	100 / 40	1.03	10	Pass	10.33				
UTILITY - CF	FU-CF	COOPER	T-Tin, 10T	24900	27000	10	1.68	5	Pass	33.57		2.04	8.00	25.53
UTILITY - CSI	FU-CSI	COOPER	358C10	24900	23000	25	1.56	1	Fail	156.44		1.78	1.60	111.39
UTILITY - CTB	FU-CTB	COOPER	T-Tin, 15T	24900	27000	15	1.61	5	Pass	32.26		1.88	8.00	23.55
UTILITY - CYO	FU-CYO	COOPER	T-Tin, 15T	24900	27000	15	1.79	5	Pass	35.77		2.25	8.00	28.13
VENT FANS SERVICE SHOP	FU-VFSS #1	GOULD SHAWMUT	TRS	480	600	15	1.06	200	Pass	0.53				

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Protective Devices Evaluation Table
Ontario Northland Cochrane Site
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2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
VENT FANS SERVICE SHOP	FU-VFSS #2	GOULD SHAWMUT	TRS	480	600	15	1.06	200	Pass	0.53				
VENT FANS SERVICE SHOP	FU-VFSS #3	BUSSMANN	FRS-R15A	480	600	15	1.06	200	Pass	0.53				
VENT FANS SERVICE SHOP	FU-VFSS #4	BUSSMANN	KTS-R	480	600	20	1.06	200	Pass	0.53				
WAYSIDE SWBD	CB-APU WAYSIDE	Utility Relay Co	RL-800	480	480	800 / 400	30.77	42	Pass	73.27				
WAYSIDE SWBD	CB-BUNKHOUSE WAYSIDE	Utility Relay Co	RL-800	480	480	800	30.77	42	Pass	73.27				
WAYSIDE SWBD	CB-TRACK1 WAYSIDE	Utility Relay Co	RL-800	480	480	800	30.77	42	Pass	73.27				
WAYSIDE SWBD	CB-TRACK2 WAYSIDE	Utility Relay Co	RL-800	480	480	800	30.77	42	Pass	73.27				
WAYSIDE SWBD	CB-TRACK3 WAYSIDE	Utility Relay Co	RL-800	480	480	800	30.77	42	Pass	73.27				
WAYSIDE SWBD	CB-TRACK4 WAYSIDE	Utility Relay Co	RL-800	480	480	800	30.77	42	Pass	73.27				
WELDER PLUG #1	FU-WELDER PLUG #1	LITTELFUSE	FLSR	480	600	60	2.47	200	Pass	1.23				
WELDER PLUG #2	FU-WELDER PLUG #2	LITTELFUSE	FLSR	480	600	60	3.58	200	Pass	1.79				
WHITING JACKS ED PLUG	FU-MAIN WHITING JACKS ED PLUG	GOULD SHAWMUT	TRS	480	600	30	2.21	200	Pass	1.11				

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Protective Devices Evaluation Table

Ontario Northland Cochrane Site

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Scenario: Utility Delivering Maximum Available Short-Circuit Current

2025-12-31

Connected Bus	Device Name	Manufacture	Model	Bus Voltage	Device Voltage (V)	Frame / Trip (A)	Calcul. Interrup. Current (kA)	Device Interrup. Rated Current (kA)	Device Status	Interrup. Rating (%)	Series Rating (kA)	Calc. Momen. Current (kA)	Device Momen. Rated Current (kA)	Momen. Rating (%)
WHITING JACKS PLUG	FU-MAIN WHITING JACKS PLUG	GOULD SHAWMUT	TRS	480	600	30	1.56	200	Pass	0.78				

LEGEND

Pass
Fail
Unknown

In order to ensure that all the equipment in the system are properly rated, as required in the OESC Section 14-012 [2] , we recommend further investigation of protective devices listed in Table 3.3 to verify these results and the implementation of an adequate corrective action such as replacement of protective devices that have interrupting ratings that exceed the calculated interrupting currents for the protective devices in this system.

Table 3.3: Inadequately Rated Protective Devices

Bus Name	Device Name	Mfg.	Model	Size (A)	Device Rated Current (kA)	Calculated Current (kA)	Status
COACH SHOP SWBD	FU-TX-A	LITTELFUSE	NLN	100	50.0	7.54	Fail
Pole 15	FU-TX-WAY-SIDE	S&C	Positrol, 65N	65	7.1	1.53	Fail
UTILITY - CSI	FU-CSI	COOPER	358C10	25	1.0	1.56	Fail

LEGEND

Failed Devices

The devices listed in the above table is a summary of protective devices that were modeled for the purpose of this arc flash analysis and may not contain all of the branch protective device that are insufficiently rated in each board. Furthermore, equipment short circuit ratings evaluations were not performed. Further investigation of listed panels and sub-fed electrical distribution equipment is required to determine an appropriate corrective action before changes are made to confirm the exact number and rating of all insufficiently rated protective devices in each board and all insufficiently rated electrical distribution equipment.

4 Protective Device Coordination Study

An over-current protective devices time-current coordination study reviews the existing protective devices settings and where appropriate, determines the suggested settings, ampere ratings, and types for the electrical power system protective devices to achieve the desired protection of the system components, such as transformers, cables, buses, and motors; and optimal selectivity between the protection devices during the fault conditions.

Using a log-log graph protective device are compared with one another taking into consideration boundaries defined by load currents, short circuit currents, and ANSI, IEEE and OESC [2] requirements.

4.1 Coordination Results

Time-current characteristics (TCC's) of protective devices are plotted and complimented with nametags representing breaker and fuse info including make, model and settings. Within the plot is a single line representation of the respective part reviewed. In areas where trip curves overlap indicates areas where selectivity may not be possible. Where possible efforts have been made to increase selectivity to assist in proper coordination of the devices, or to aid in the reduction of arc flash levels without compromising system protection. Smaller devices with fixed time current characteristics are not shown on the plots unless they directly affect the settings of an adjustable upstream device.

The overcurrent protective device time-current coordination analysis showed that there was acceptable degree of selectivity achieved among the overcurrent protection devices in the system.

We have made some comments and recommendations listed below regarding overall system overcurrent protection and coordination and in some cases, the calculated arc flash levels in the system.

4.1.1 Overcurrent Protective Device Coordination Comments and Recommendations

1) The recommended settings for the main circuit breakers achieved acceptable selectivity with upstream fuses and downstream protective devices in the main switchboards, resulting in acceptable overall coordination. In addition, setting adjustments have been identified for several existing protective devices to further enhance coordination, as detailed in the settings table section of the report.

2) There is a mis-coordination in the overcurrent region between the 200A TRS fuse “FU-DISC-MAIN MDP” and the downstream 200A CE-E breaker “CB-EAST END SPL”. This is due to upstream fuse and downstream breaker are both the same size (200A). We recommend reviewing the load distribution schedule to ensure the appropriate feeder sizes throughout the system [TCC: 03].

3) There is minor mis-coordination between the 25A Bay-O-Net Dual Sensing Fuse Link “FU-CSI” and the downstream 800A NM breaker “CB-MAIN CSI”. This is due to the presence of fixed thermal magnetic breaker downstream. Overall, this lack of coordination is minor and we have no concern since the upstream fuse “FU-CSI” and the downstream breaker “CB-MAIN CSI” are both in series [TCC: 07].

4) Whenever a breaker with instantaneous protection enabled or is designed with instantaneous override is used to feed one or more breakers with instantaneous protection enabled or is designed with instantaneous override downstream an overlap in the instantaneous trip region can occur. As such a fault of high enough magnitude to trip in the instantaneous region can cause an upstream breaker with instantaneous protection enabled or is designed with instantaneous override to trip due to the mis-coordination. The available remedies may be to replace the feeder circuit breakers with electronic trip units with appropriate adjustable LSI capabilities or to install circuit breaker models that are recognized selectively coordinated pairs based on manufacturer testing.

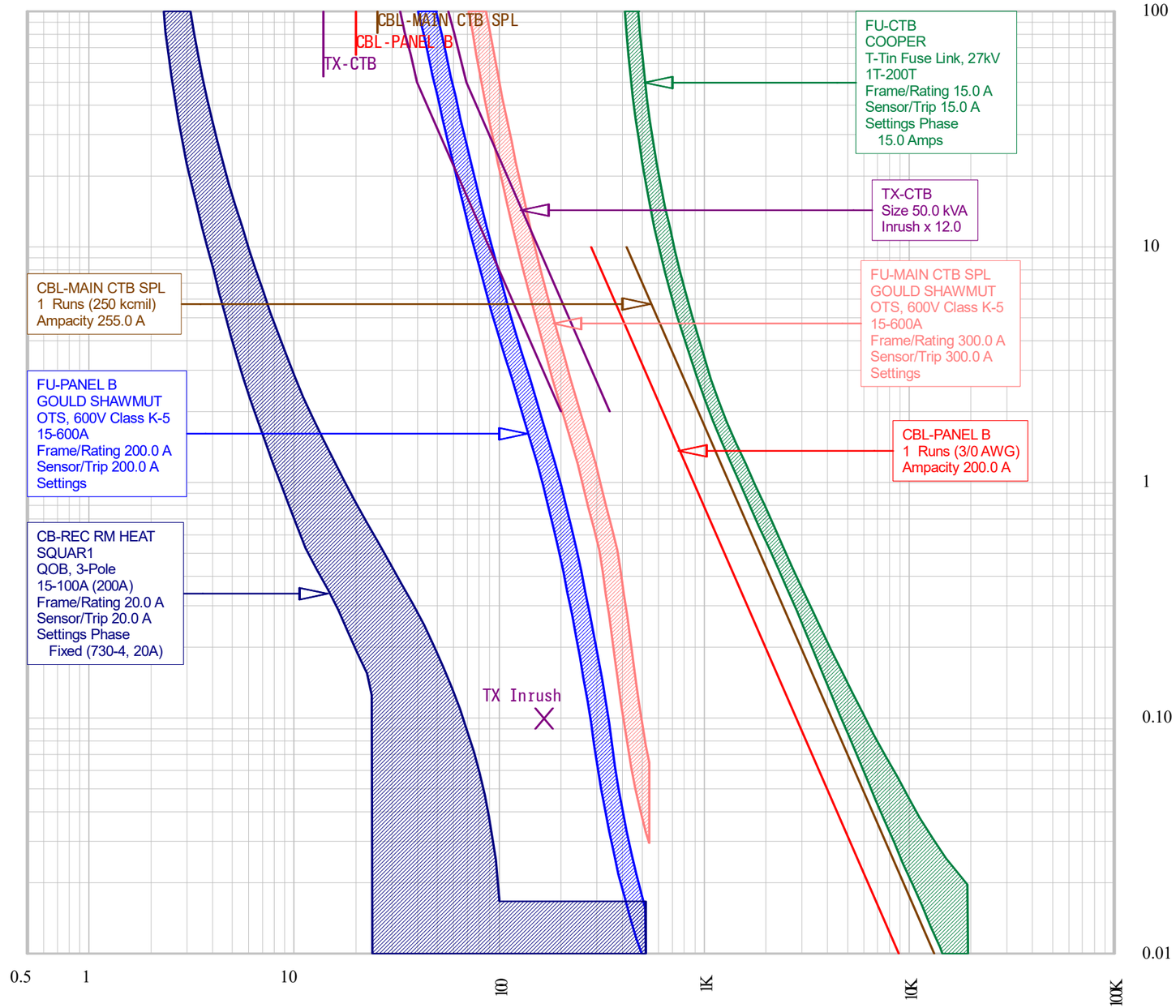
5) The recommended settings for the main circuit breaker “CB-POWERHOUSE SWBD” achieved acceptable ground fault over current selectivity with the feeder breakers which have ground settings in the main distribution switchboard as shown TCC: 17. However, the ground over-current coordination plots show that there is limited ground selectivity between the phase over-current settings of the devices that do not have ground fault protection and the devices that have ground fault protection. This is a common issue when a power distribution system has a mix of devices with ground fault protection and without ground fault protection. The mis-coordination between these devices is usually considered an acceptable limitation of selectivity during the design process. Additional ground fault protection should be considered for any loads that are particularly vulnerable to ground faults, such as equipment that is exposed adverse climate conditions. This can significantly improve the overall system selectivity given that 90% of all overcurrent faults are ground faults.

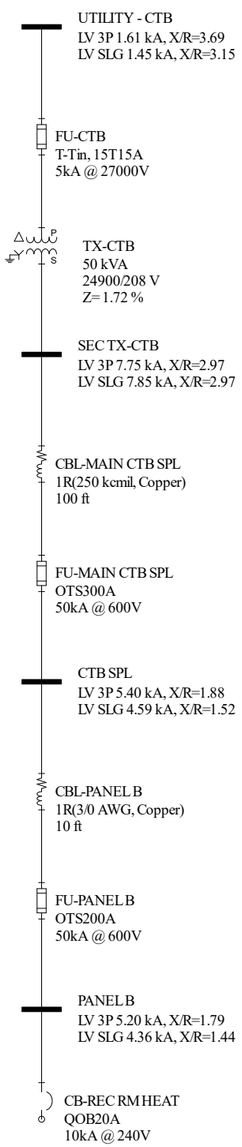
6) There is a mis-coordination in the overcurrent region between the 400A NGS breaker “CB-POWERHOUSE SWBD” and the downstream 400A HKD breaker “CB-COACH SHOP SWBD”. This is due to upstream main breaker “CB-POWERHOUSE SWBD” and branch breaker “CB-COACH SHOP SWBD” are both the same size (400A). We recommend reviewing the load distribution schedule to ensure the appropriate feeder sizes throughout the system [TCC:24].

7) There is a mis-coordination in the overcurrent region between the 100A NLN fuse “FU-TX-A” and the downstream 200A NLN fuse “FU-PANEL A (CS)”. This is due to upstream fuse “FU-TX-A” and downstream fuse “FU-PANEL A (CS)” both have similar equivalent ampacities (100A). We recommend the 100A NLN fuse “FU-TX-A” with a same size time delay fuse such as AJT [TCC:25].

4.2 Time Current Coordination Plots

4.2.1 Recommended Settings



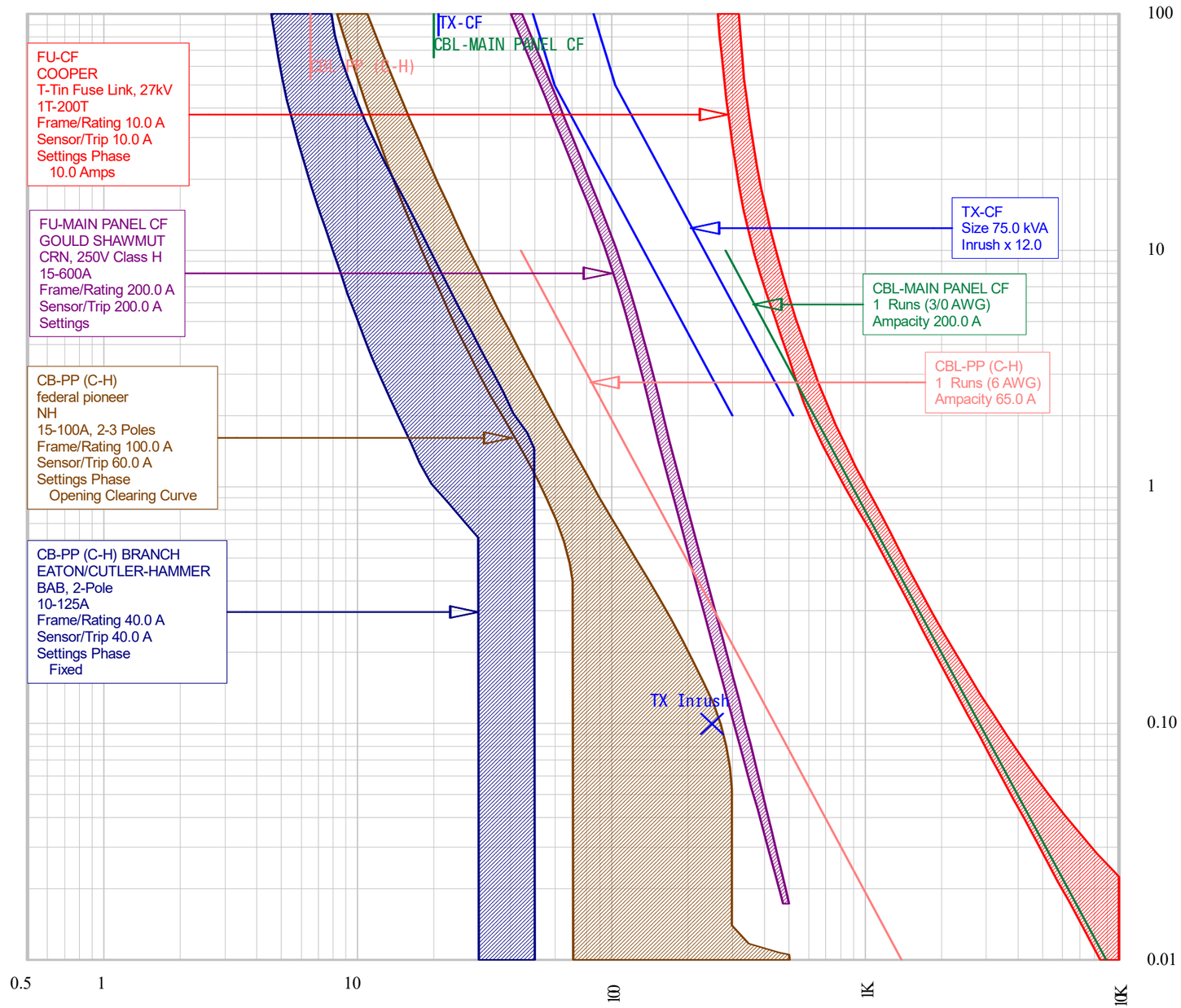


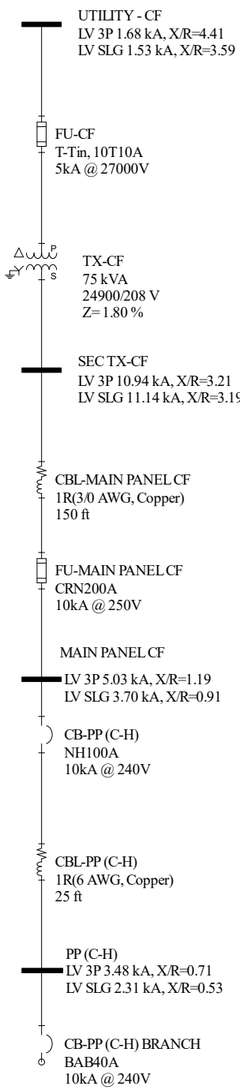
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TCC: 01) FU-CTB to CB-REC RM HEAT
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 208V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



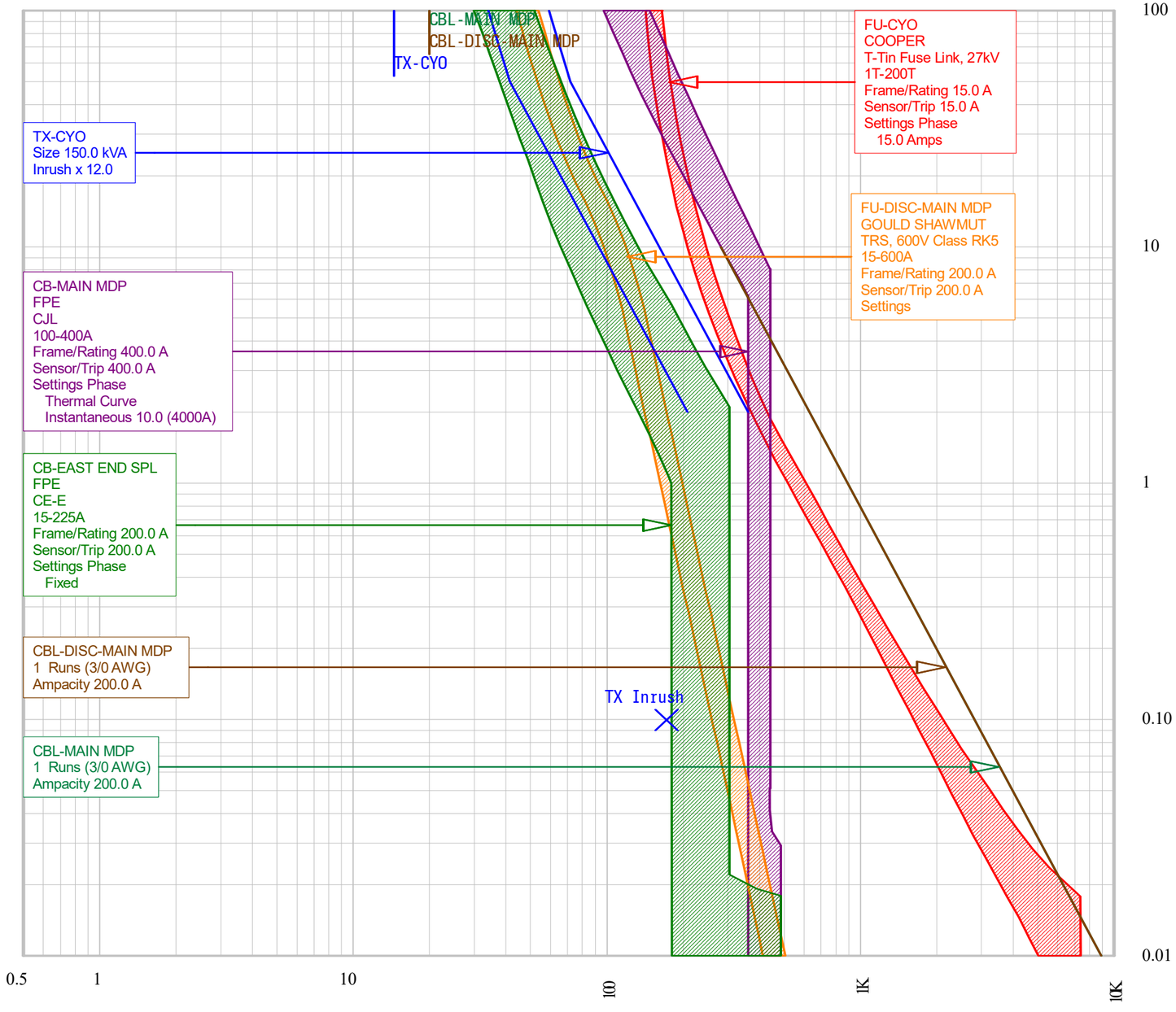


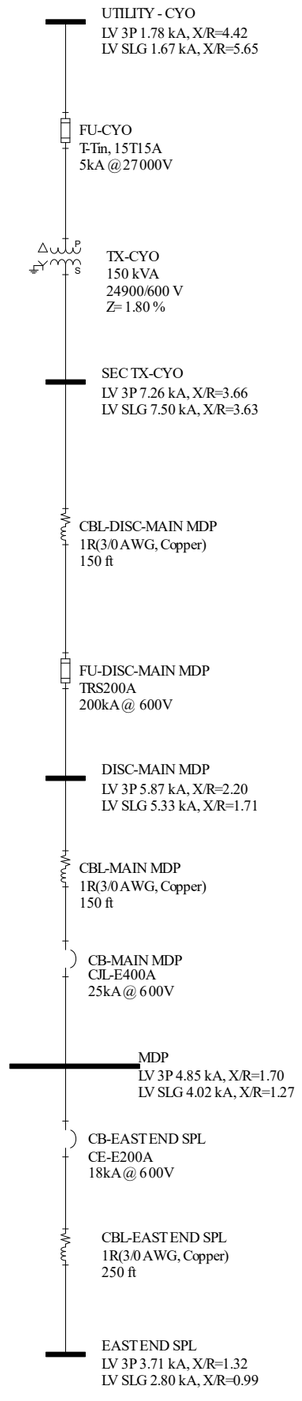
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 02) FU-CF to CB-PP (C-H) BRANCH
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 208V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



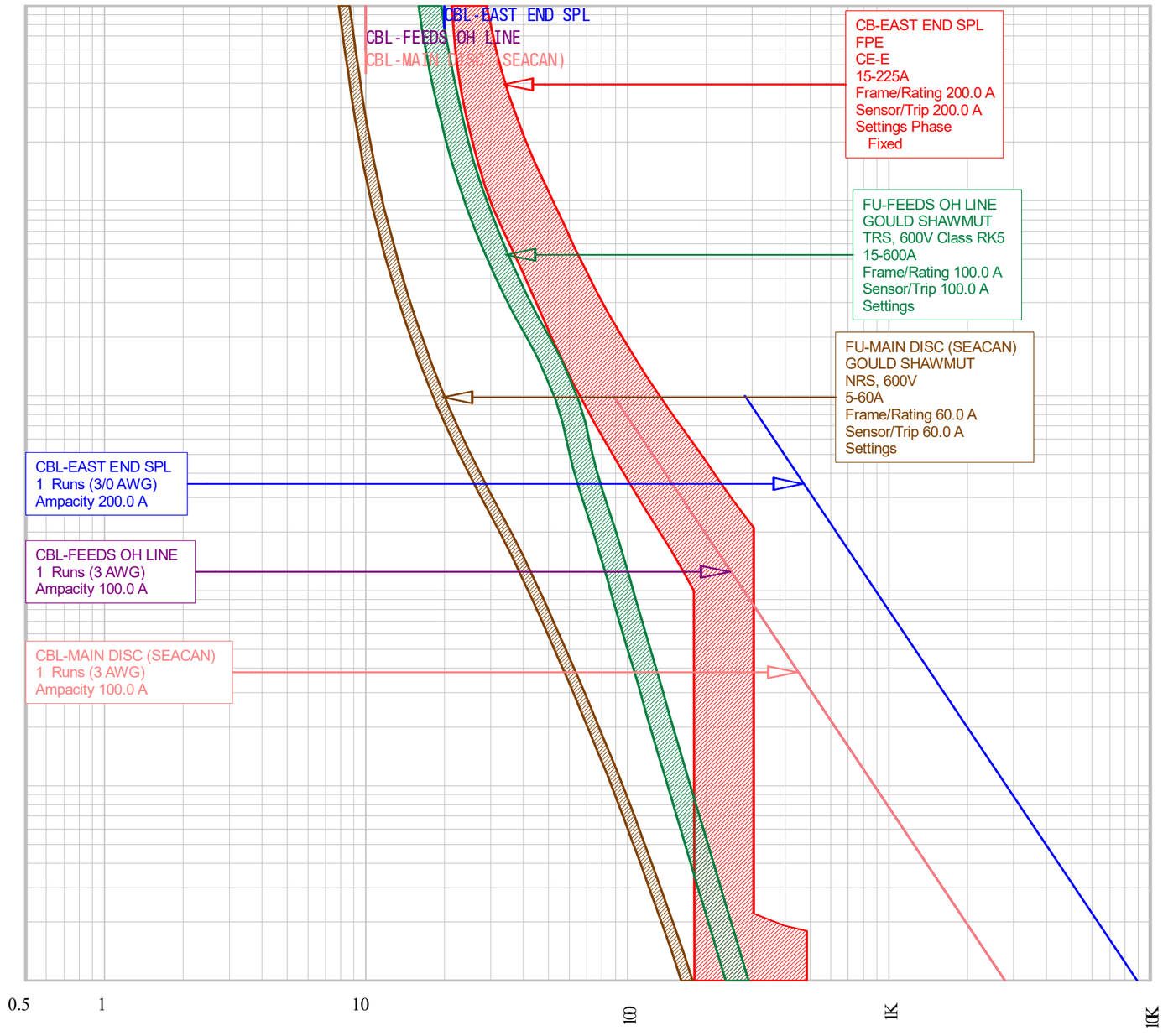


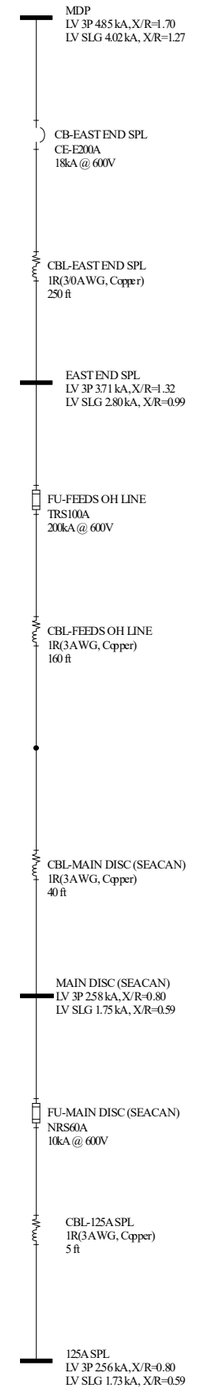
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 03) FU-CYO to CB-EAST END SPL
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



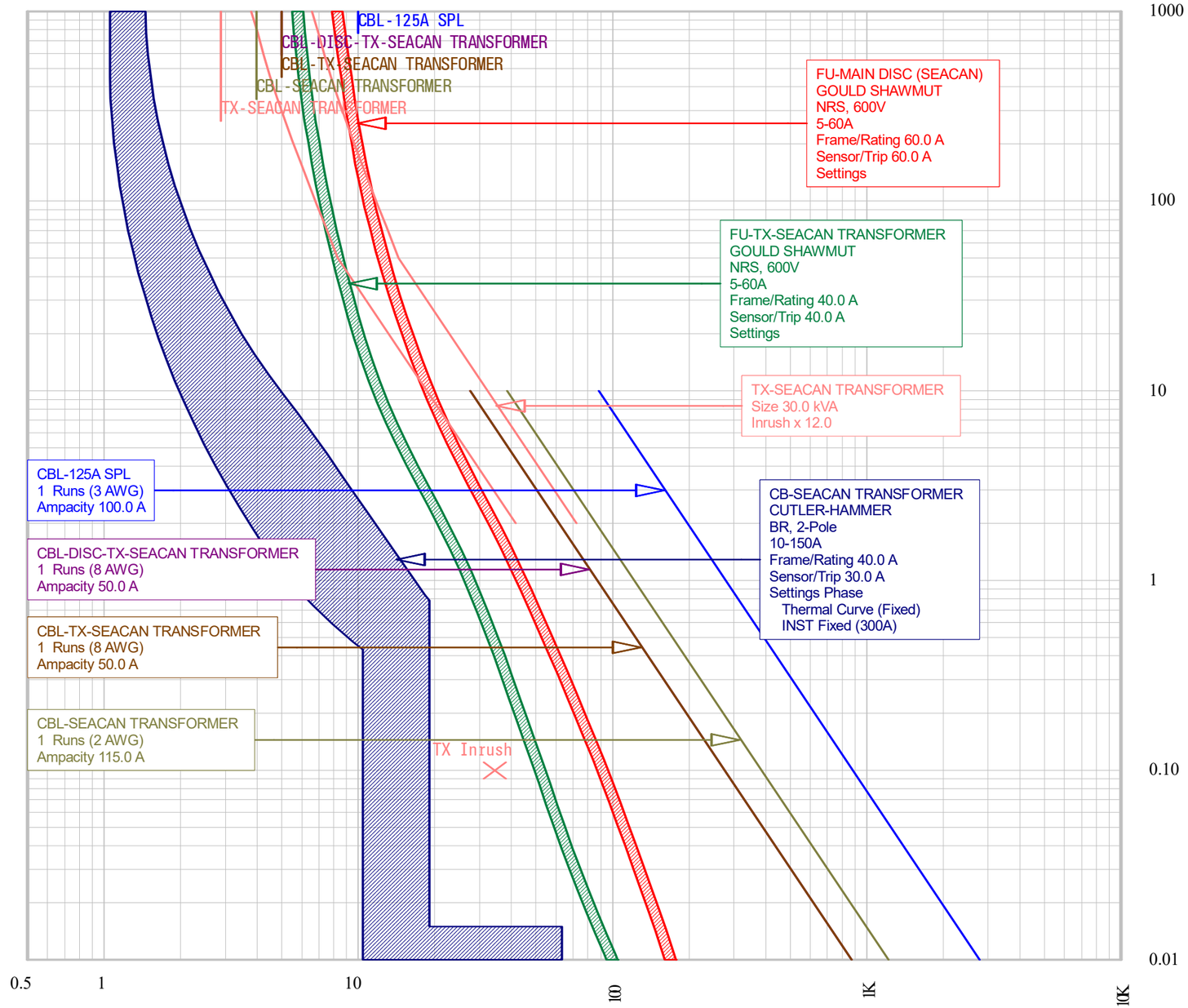


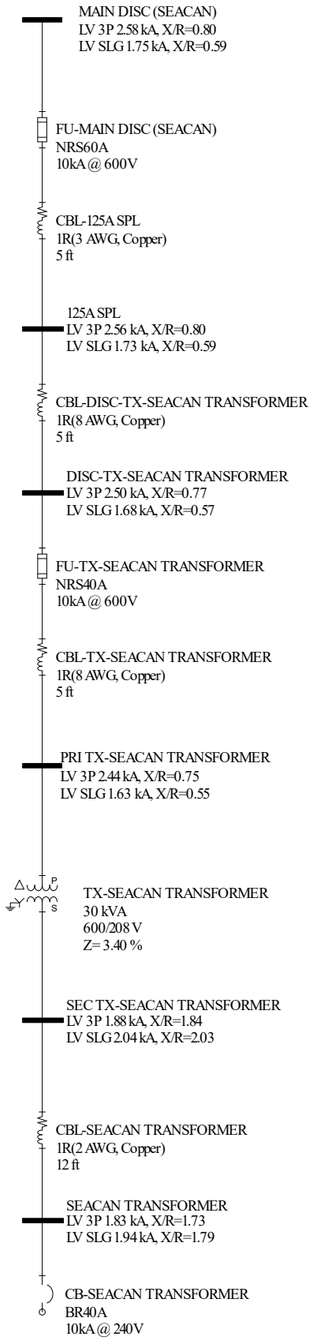
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 04) CB-EAST END SPL to FU-MAIN DISC (SEACAN)
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



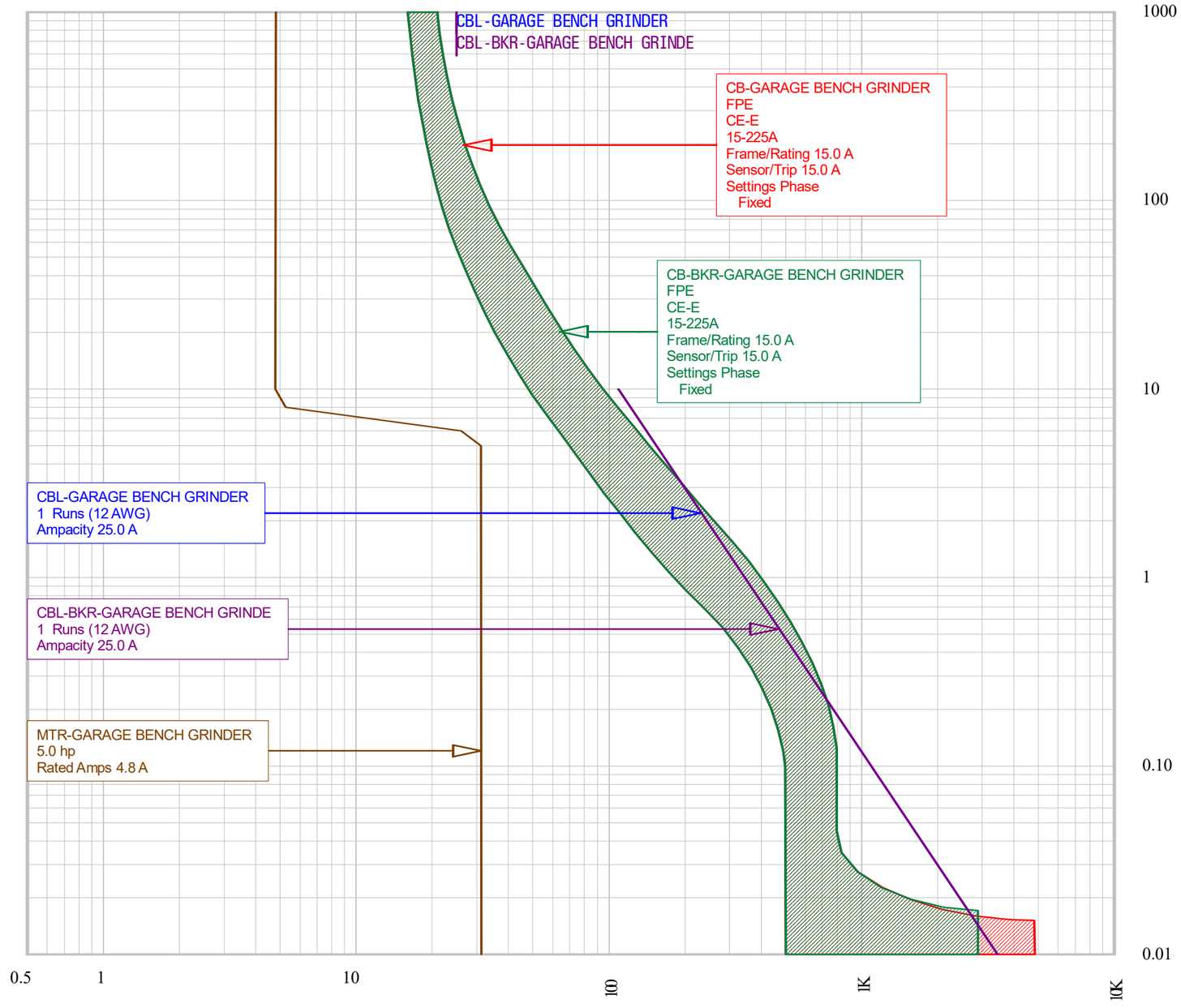


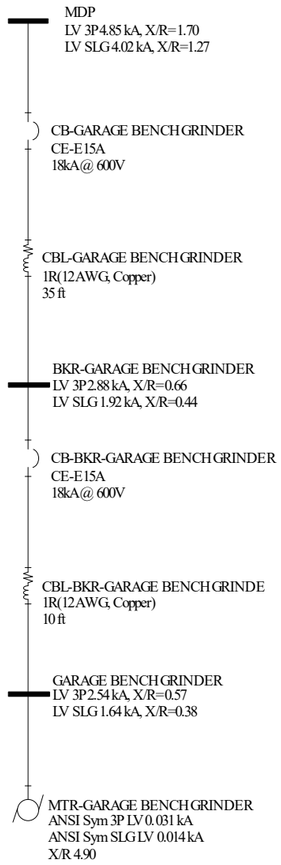
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 05) FU-MAIN DISC (SEACAN) to CB-SEACAN TRANSFORMER
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



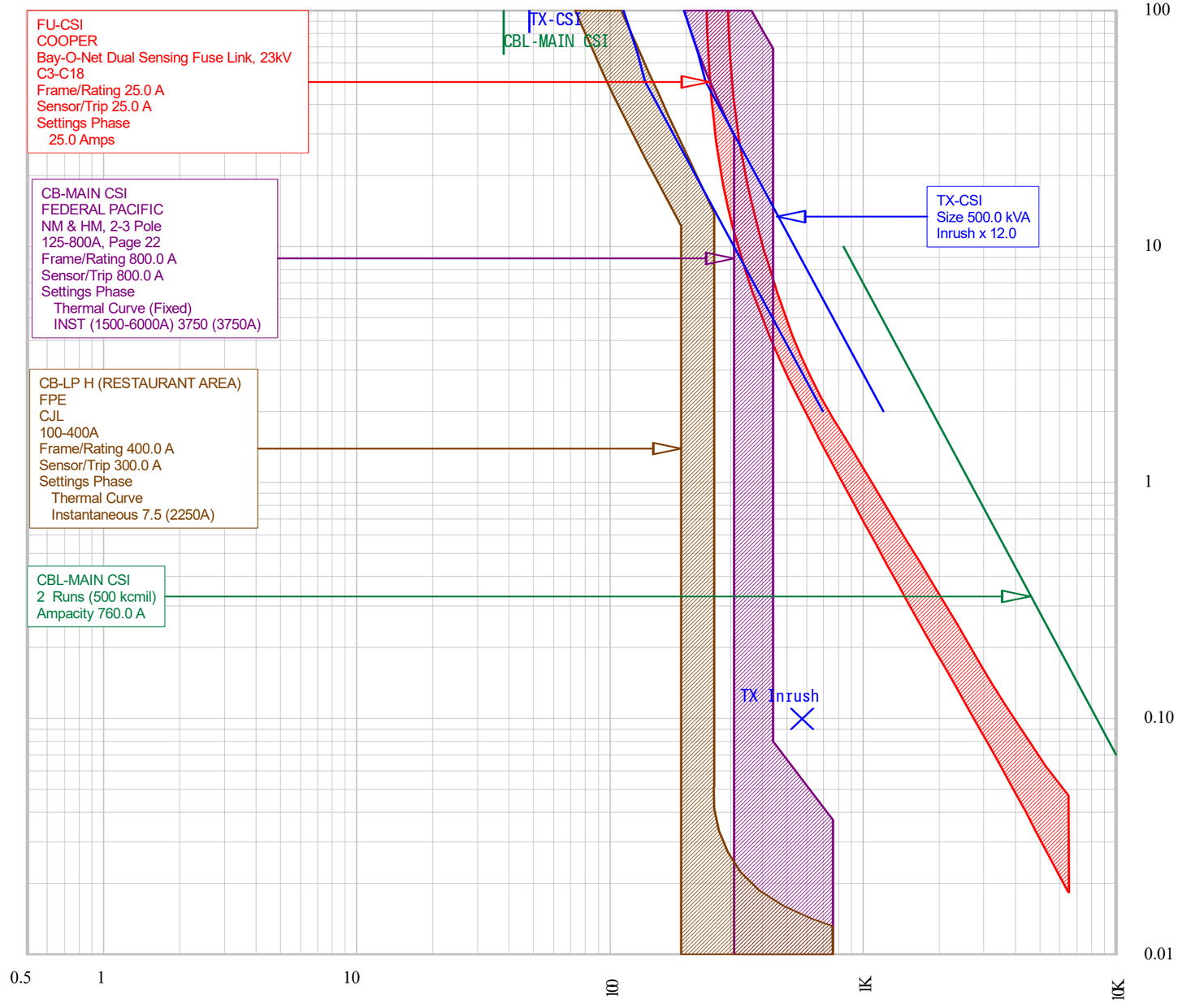


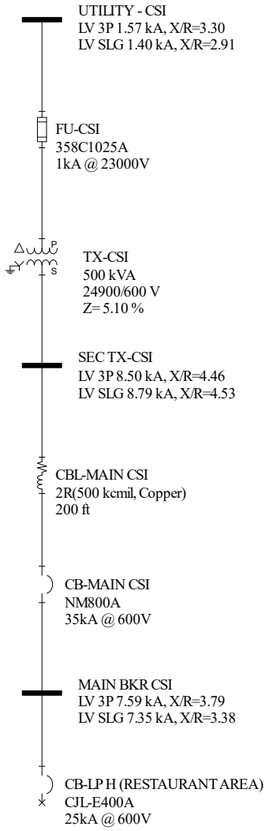
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 06) CB-GARAGE BENCH GRINDER to MTR-GARAGE BENCH GRINDER
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 1
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



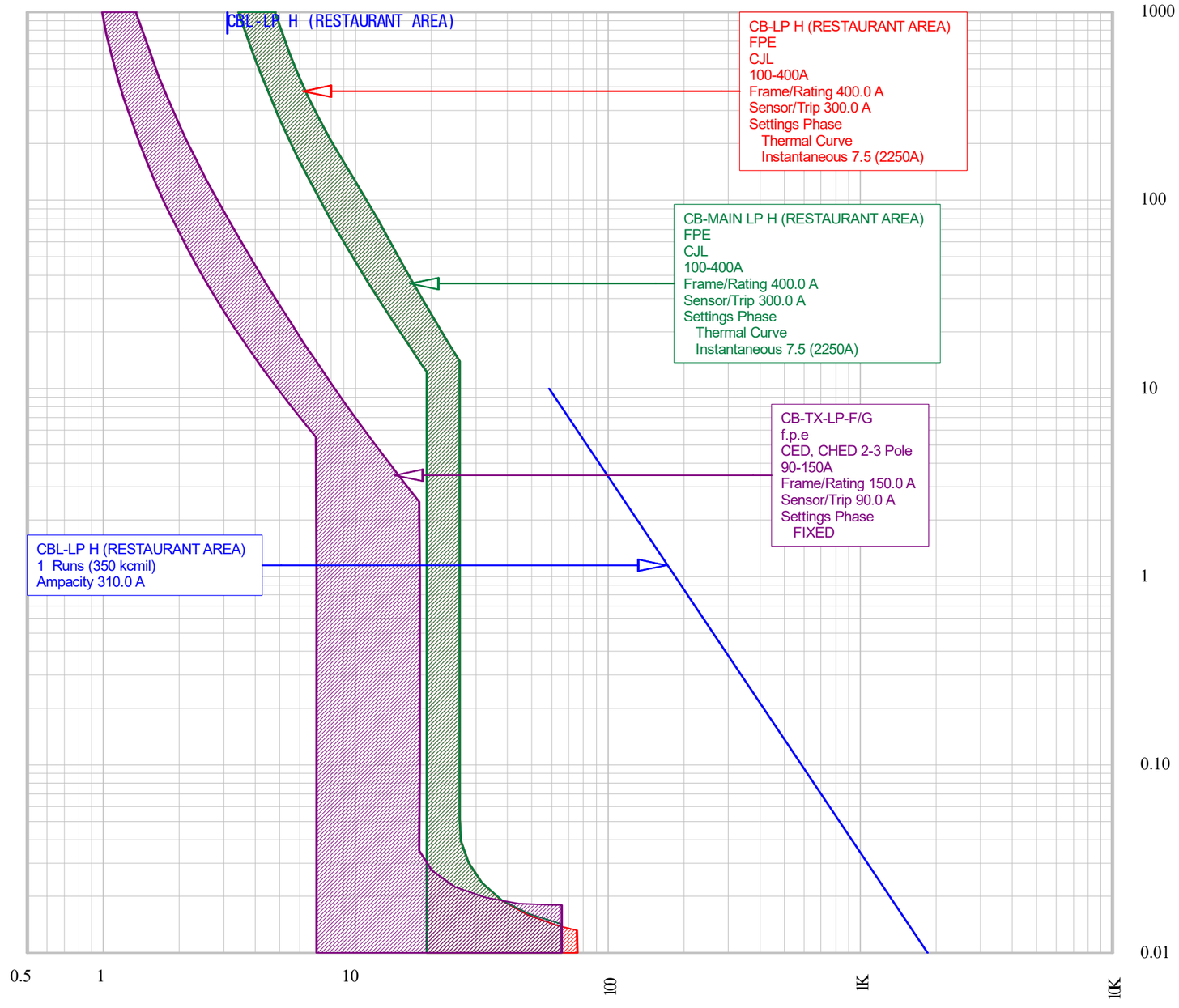


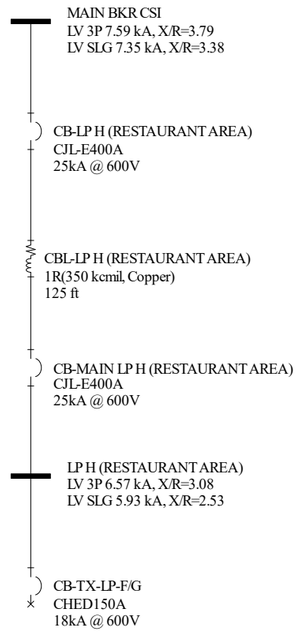
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 07) FU-CSI to CB-RESTAURANT AREA
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



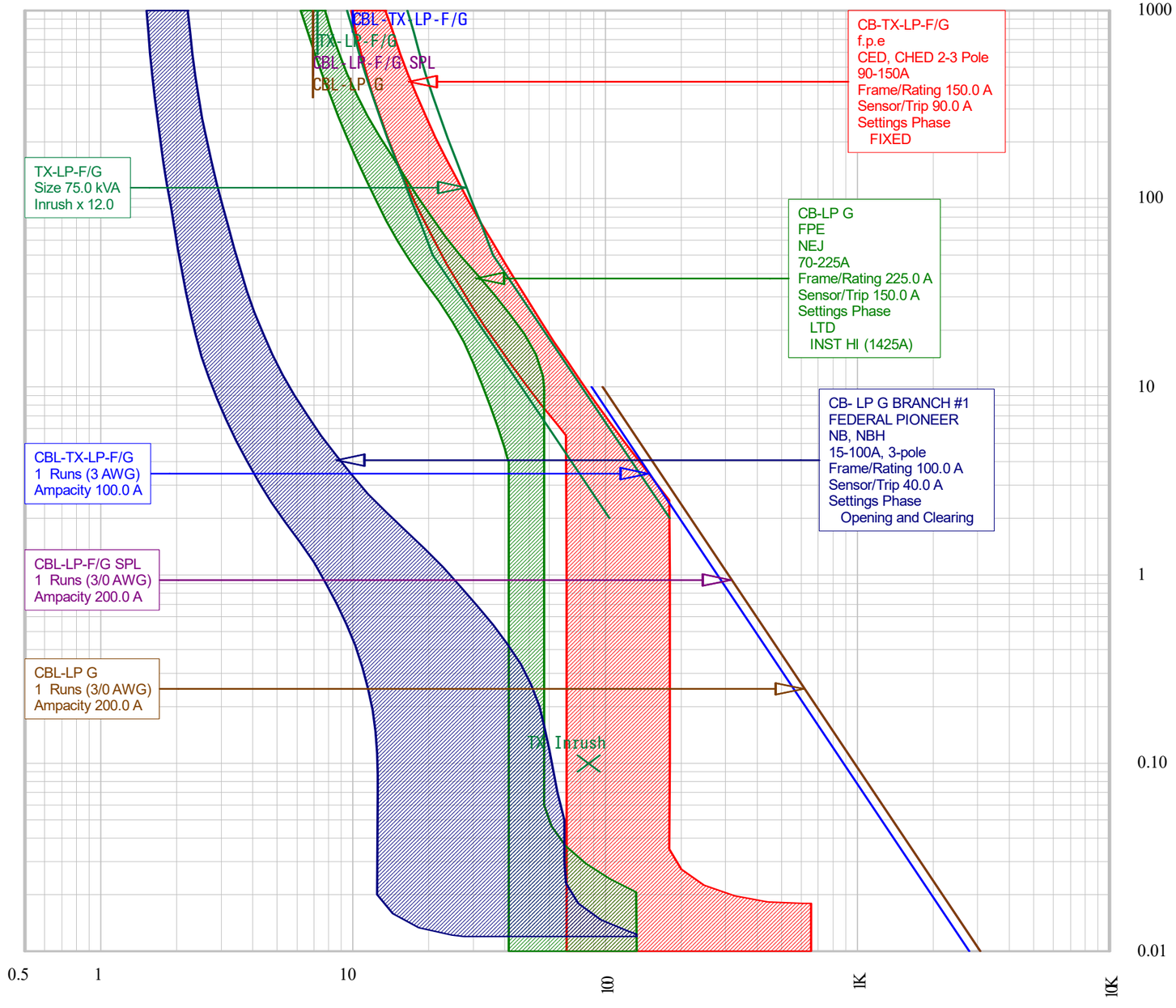


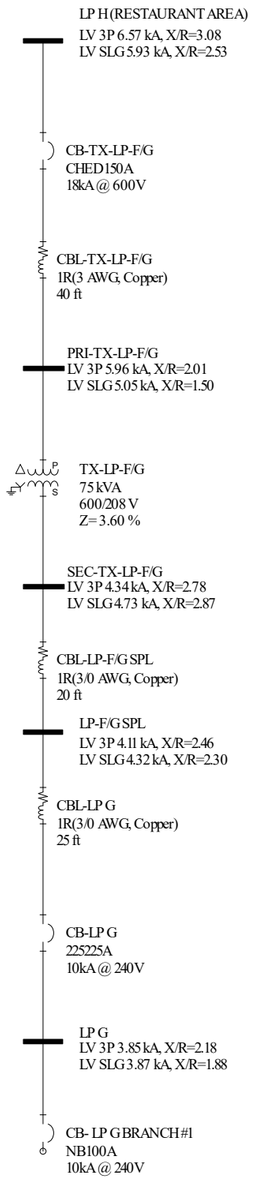
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

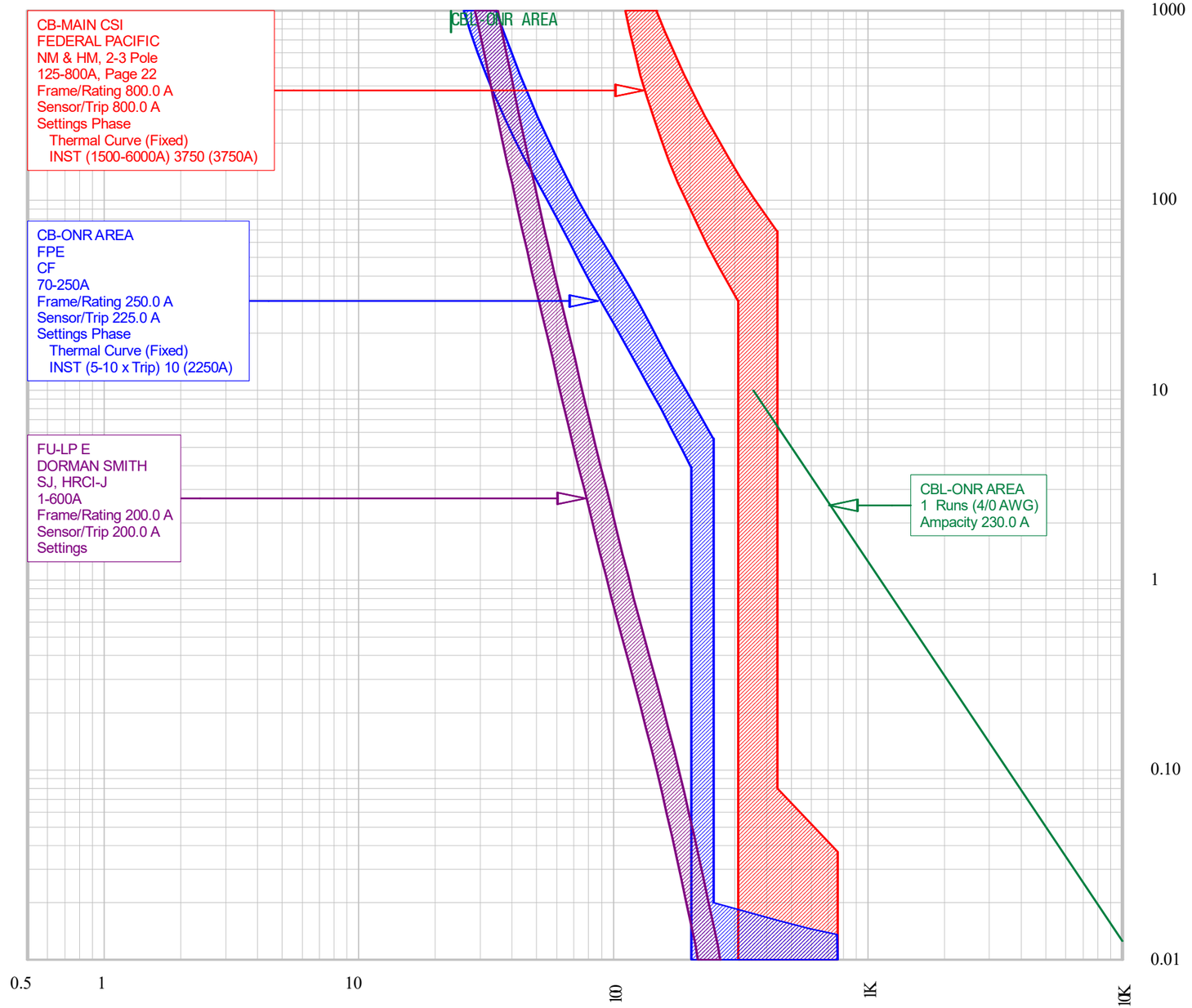
TCC: 08) CB-RESTAURANT AREA to CB-TX-LP-F,G
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

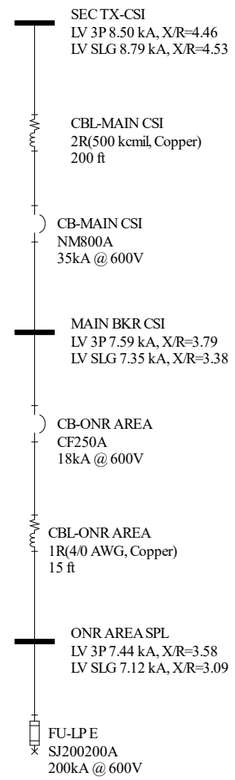
Current in Amps x 100
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.


CBL-TX-LP-F/G
TX-LP-F/G
CBL-LP-F/G SPL
CBL-LP G
CB-TX-LP-F/G
f.p.e
CED, CHED 2-3 Pole
90-150A
Frame/Rating 150.0 A
Sensor/Trip 90.0 A
Settings Phase
FIXED
TX-LP-F/G
Size 75.0 kVA
Inrush x 12.0
CB-LP G
FPE
NEJ
70-225A
Frame/Rating 225.0 A
Sensor/Trip 150.0 A
Settings Phase
LTD
INST HI (1425A)
CB- LP G BRANCH #1
FEDERAL PIONEER
NB, NBH
15-100A, 3-pole
Frame/Rating 100.0 A
Sensor/Trip 40.0 A
Settings Phase
Opening and Clearing
CBL-TX-LP-F/G
1 Runs (3 AWG)
Ampacity 100.0 A
CBL-LP-F/G SPL
1 Runs (3/0 AWG)
Ampacity 200.0 A
CBL-LP G
1 Runs (3/0 AWG)
Ampacity 200.0 A
TX Inrush
1000
100
10
1
0.10
0.01
0.5
1
10
100
1K
10K
TIME IN SECONDS
CURRENT IN AMPERES


LP H (RESTAURANT AREA)
LV 3P 6.57 kA, X/R=3.08
LV SLG 5.93 kA, X/R=2.53
CB-TX-LP-F/G
CHED150A
18kA @ 600V
CBL-TX-LP-F/G
1R(3 AWG, Copper)
40 ft
PRI-TX-LP-F/G
LV 3P 5.96 kA, X/R=2.01
LV SLG 5.05 kA, X/R=1.50
TX-LP-F/G
75 kVA
600/208 V
Z= 3.60 %
SEC-TX-LP-F/G
LV 3P 4.34 kA, X/R=2.78
LV SLG 4.73 kA, X/R=2.87
CBL-LP-F/G SPL
1R(3/0 AWG, Copper)
20 ft
LP-F/G SPL
LV 3P 4.11 kA, X/R=2.46
LV SLG 4.32 kA, X/R=2.30
CBL-LP G
1R(3/0 AWG, Copper)
25 ft
CB-LP G
225225A
10kA @ 240V
LP G
LV 3P 3.85 kA, X/R=2.18
LV SLG 3.87 kA, X/R=1.88
CB- LP G BRANCH #1
NB100A
10kA @ 240V



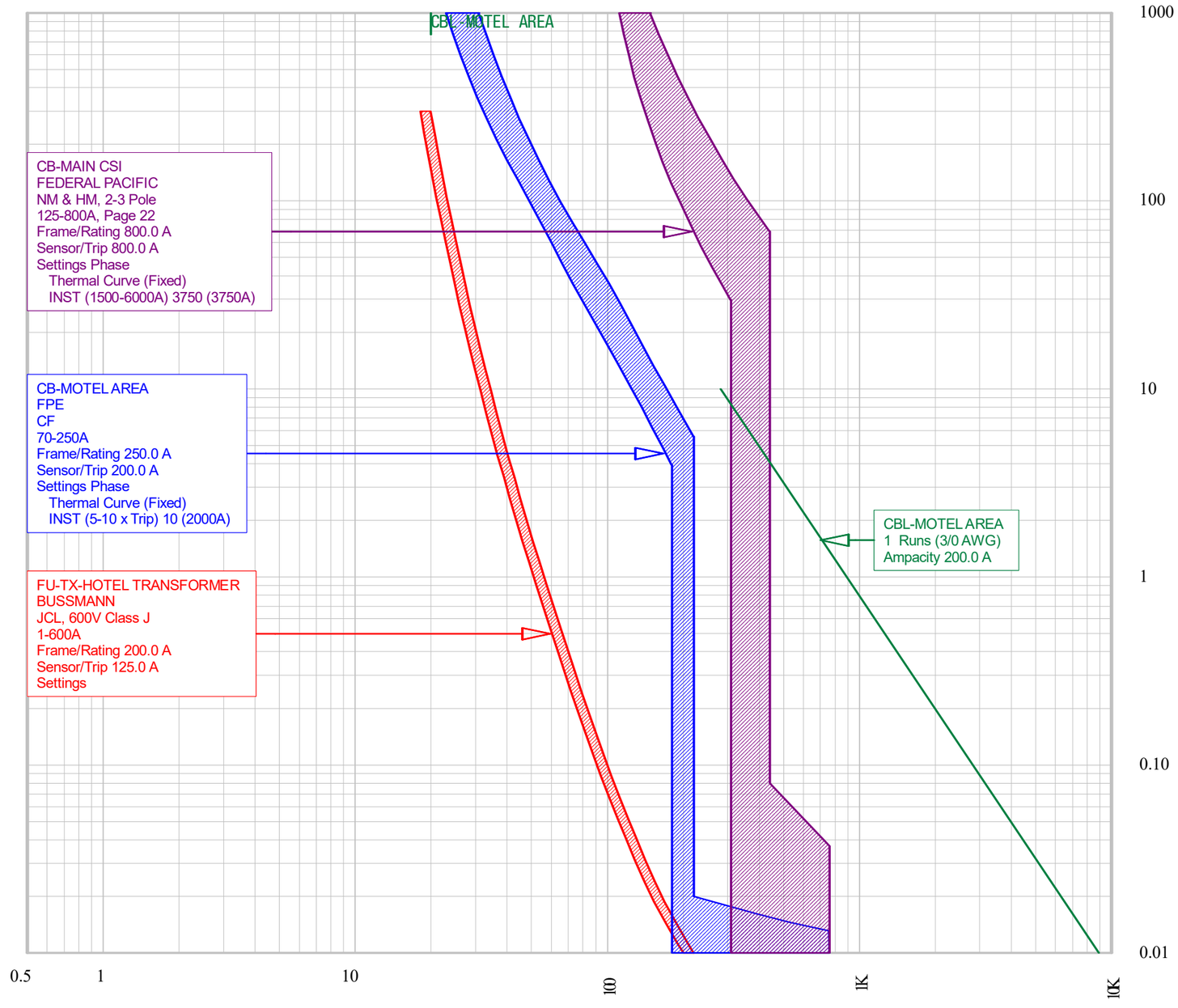


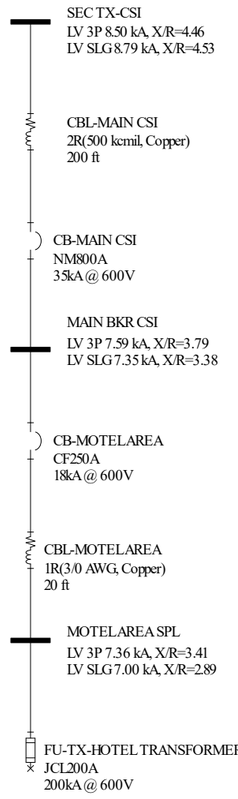
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 10) CB-MAIN CSI to FU-LP E
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



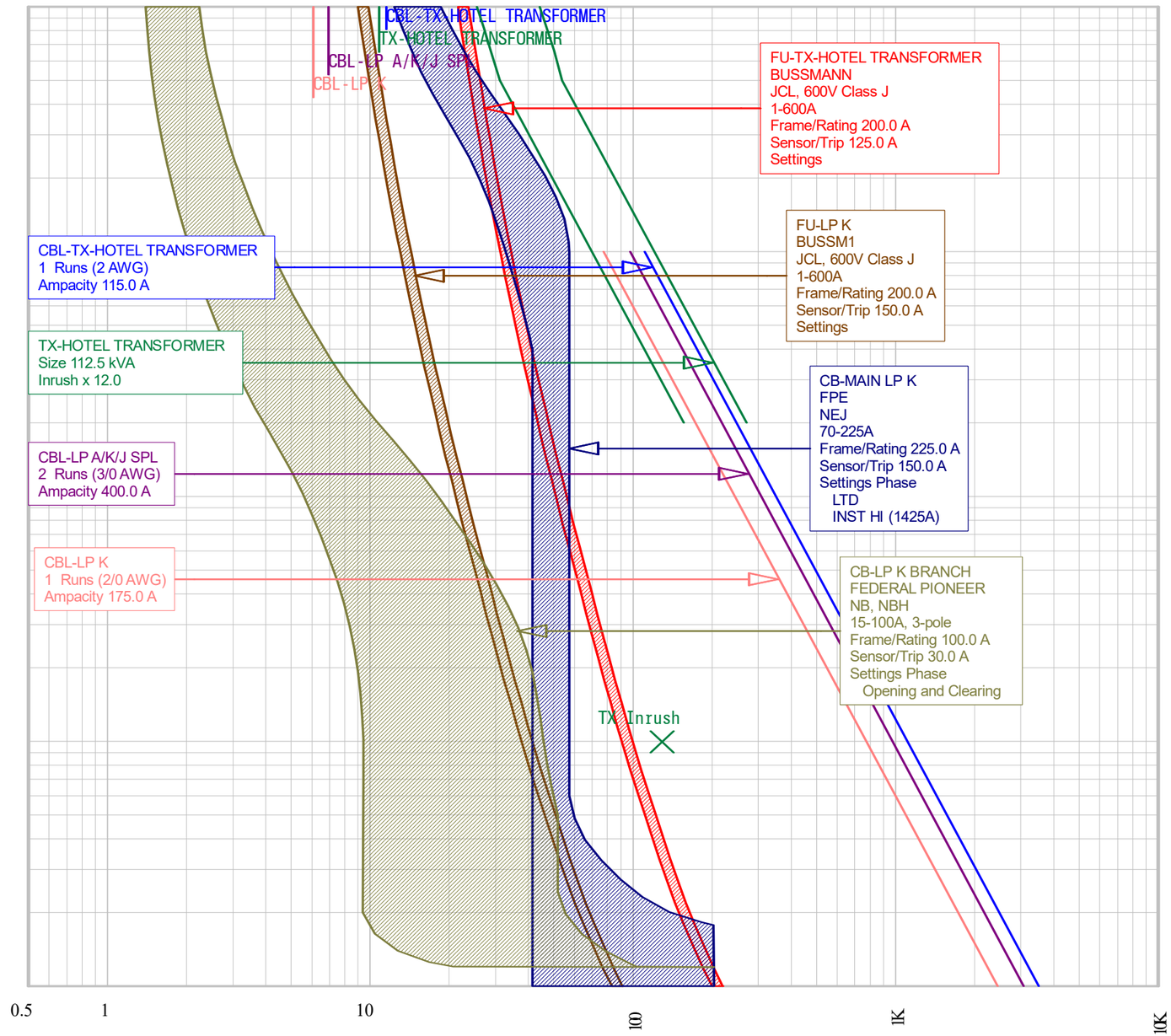


QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 11) CB-MAIN CSI to FU-TX-HOTEL TRANSFORMER
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



MOTEL AREA SPL
LV 3P 7.36 kA, X/R=3.41
LV SLG 7.00 kA, X/R=2.89

FU-TX-HOTEL TRANSFORMER
JCL200A
200kA @ 600V

CBL-TX-HOTEL TRANSFORMER
1R(2 AWG, Copper)
6 ft

PRI TX-HOTEL TRANSFORMER
LV 3P 7.25 kA, X/R=3.15
LV SLG 6.84 kA, X/R=2.59

TX-HOTEL TRANSFORMER
113 kVA
600/208 V
Z= 3.10 %

SEC TX-HOTEL TRANSFORMER
LV 3P 6.80 kA, X/R=3.31
LV SLG 7.63 kA, X/R=3.33

CBL-LP A/K/J SPL
2R(3/0 AWG, Copper)
6 ft

LP A/K/J SPL
LV 3P 6.72 kA, X/R=3.19
LV SLG 7.46 kA, X/R=3.10

FU-LP K
JCL200A
200kA @ 600V

CBL-LP K
1R(2/0 AWG, Copper)
30 ft

CB-MAIN LP K
225225A
10kA @ 240V

LP K
LV 3P 5.87 kA, X/R=2.22
LV SLG 5.88 kA, X/R=1.74

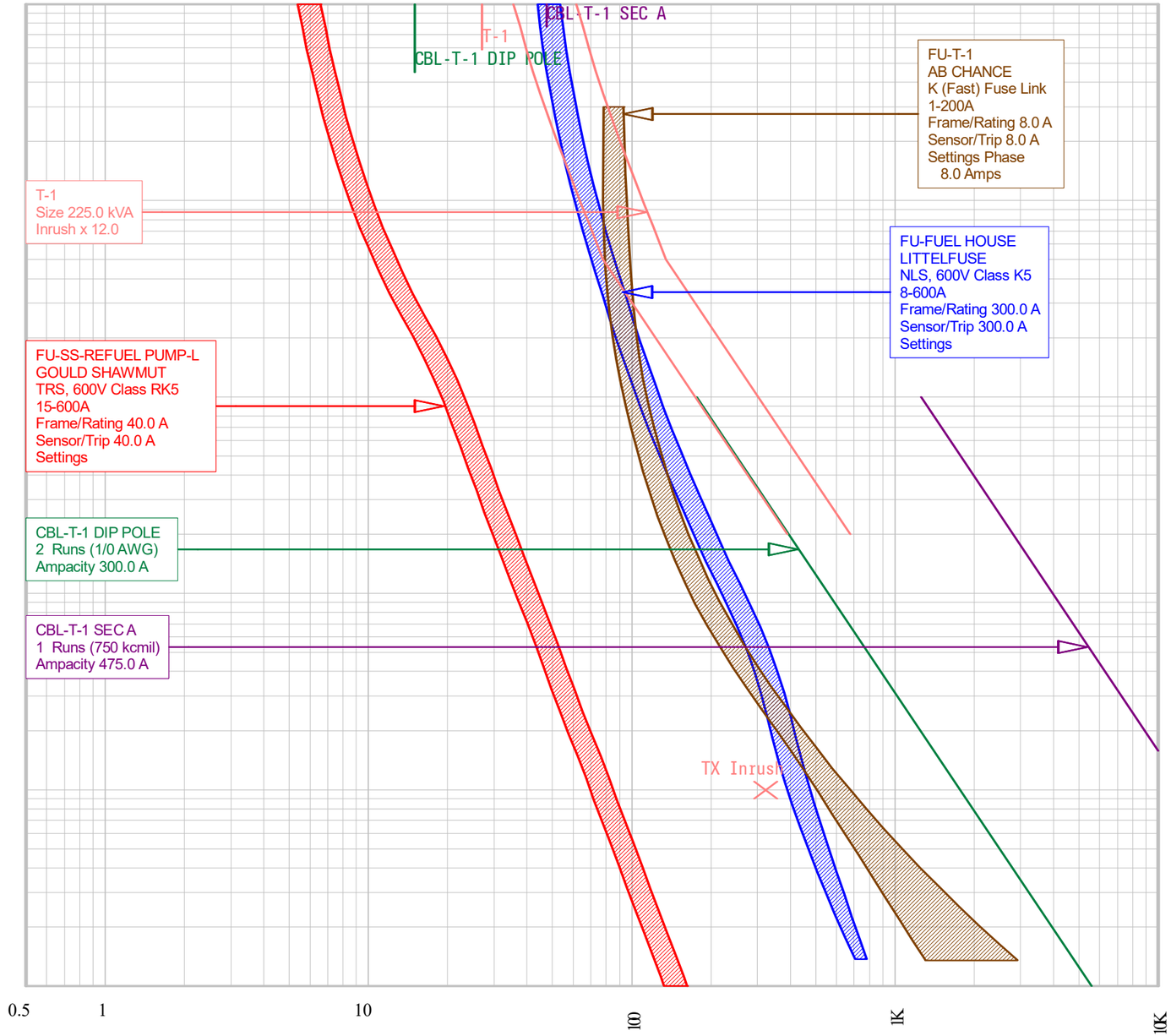
CB-LP K BRANCH
NB100A
10kA @ 240V

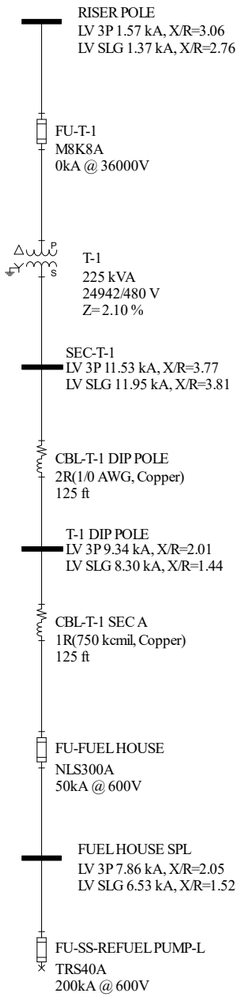
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 12) FU-TX-HOTEL TRANSFORMER to CB-LP K BRANCH
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 600V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



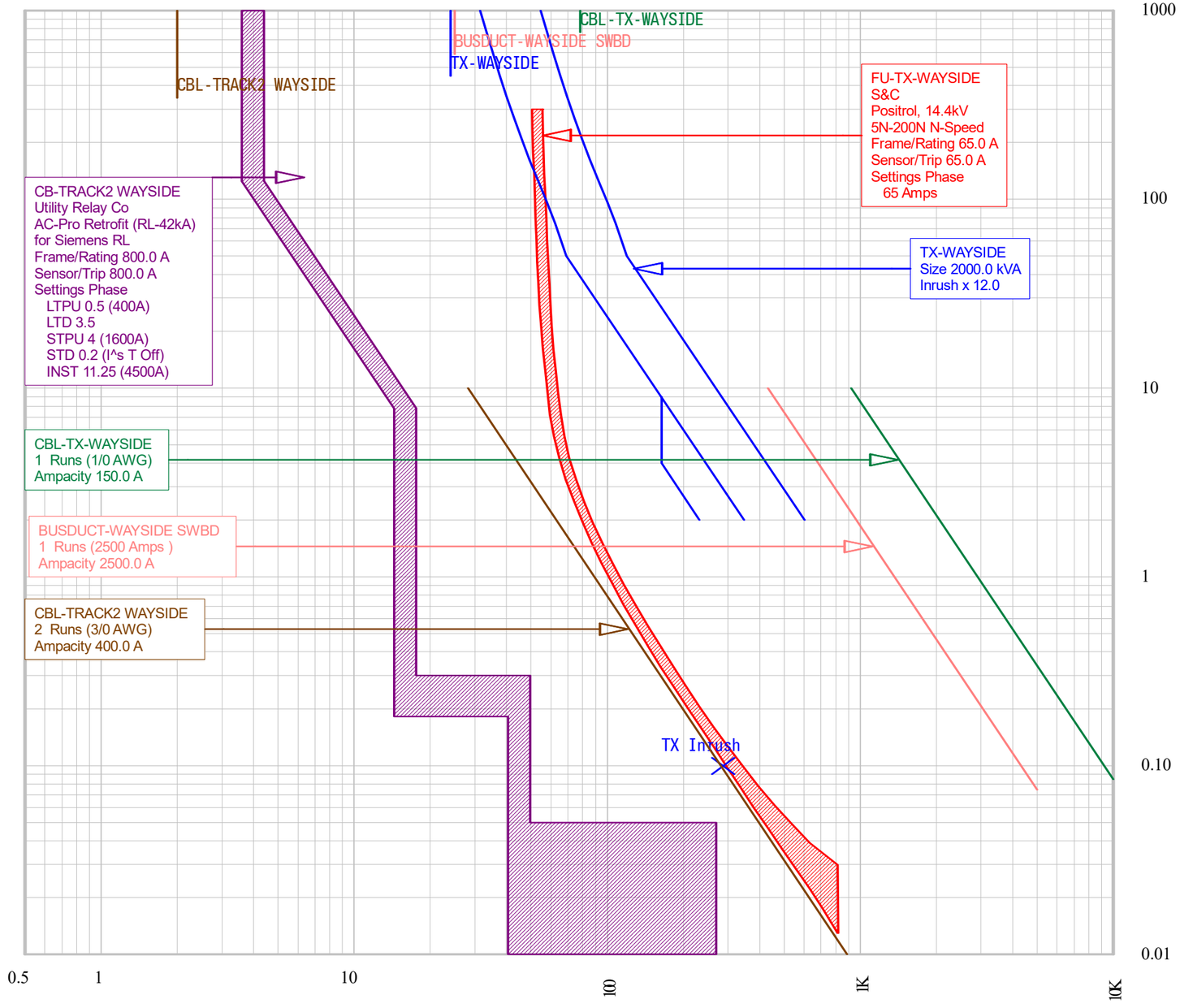


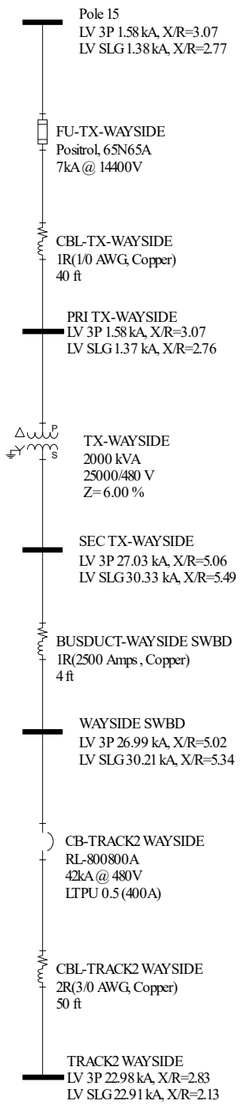
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 13) FU-T-1 to FU-SS-REFUEL PUMP-L
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



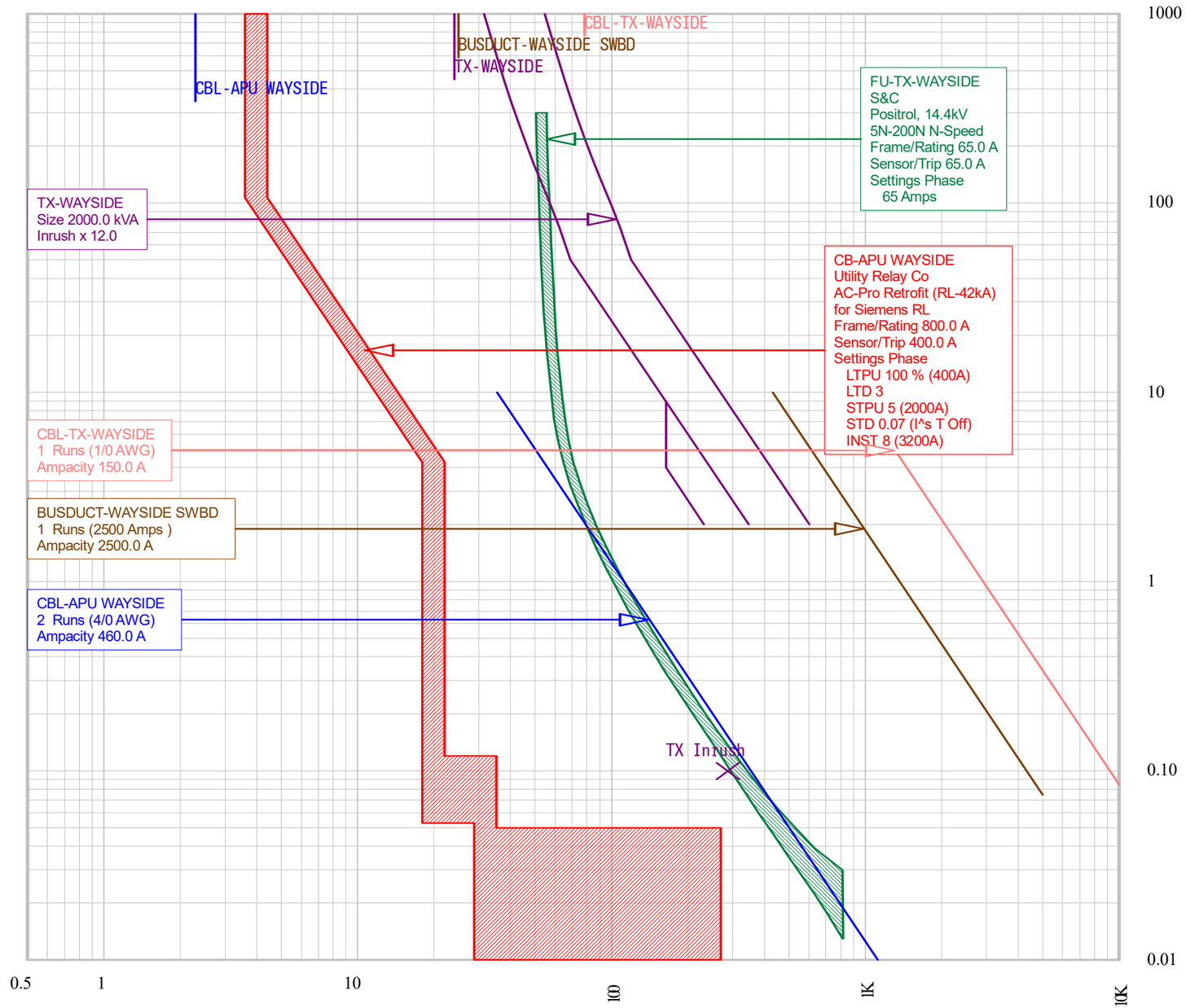


QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 14) FU-TX-WAYSIDE to CB-TRACK2 WAYSIDE
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 100
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



Pole 15
LV 3P 1.58 kA, X/R=3.07
LV SLG 1.38 kA, X/R=2.77

FU-TX-WAYSIDE
Positrol, 65N65A
7kA @ 14400V

CBL-TX-WAYSIDE
1R(1/0 AWG, Copper)
40 ft

PRI TX-WAYSIDE
LV 3P 1.58 kA, X/R=3.07
LV SLG 1.37 kA, X/R=2.76

TX-WAYSIDE
2000 kVA
25000/480 V
Z= 6.00 %

SEC TX-WAYSIDE
LV 3P 27.03 kA, X/R=5.06
LV SLG 30.33 kA, X/R=5.49

BUSDUCT-WAYSIDE SWBD
1R(2500 Amps , Copper)
4 ft

WAYSIDE SWBD
LV 3P 26.99 kA, X/R=5.02
LV SLG 30.21 kA, X/R=5.34

CB-APU WAYSIDE
RL-800800A
42kA @ 480V
LTPU 100 % (400A)

CBL-APU WAYSIDE
2R(4/0 AWG, Copper)
100 ft

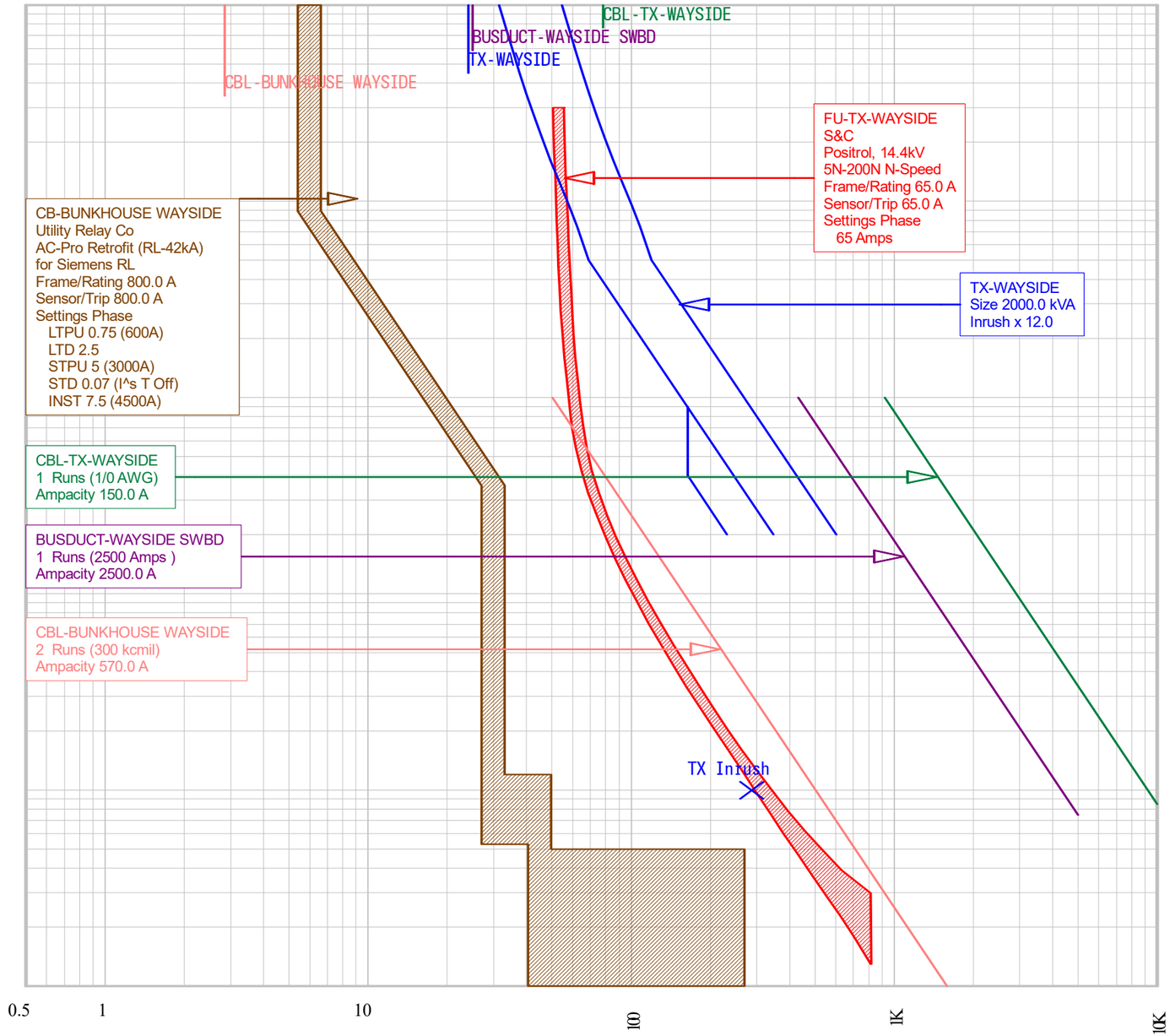
APU WAYSIDE
LV 3P 20.39 kA, X/R=2.41
LV SLG 18.98 kA, X/R=1.77

QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 15) FU-TX-WAYSIDE to CB-APU WAYSIDE
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 100
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



Pole 15
LV 3P 1.58 kA, X/R=3.07
LV SLG 1.38 kA, X/R=2.77

FU-TX-WAYSIDE
Positrol, 65N65A
7kA @ 14400V

CBL-TX-WAYSIDE
1R(1/0 AWG, Copper)
40 ft

PRI TX-WAYSIDE
LV 3P 1.58 kA, X/R=3.07
LV SLG 1.37 kA, X/R=2.76

TX-WAYSIDE
2000 kVA
25000/480 V
Z= 6.00 %

SEC TX-WAYSIDE
LV 3P 27.03 kA, X/R=5.06
LV SLG 30.33 kA, X/R=5.49

BUSDUCT-WAYSIDE SWBD
1R(2500 Amps , Copper)
4 ft

WAYSIDE SWBD
LV 3P 26.99 kA, X/R=5.02
LV SLG 30.21 kA, X/R=5.34

CB-BUNKHOUSE WAYSIDE
RL-800800A
42kA @ 480V
LTPU 0.75 (600A)

CBL-BUNKHOUSE WAYSIDE
2R(300 kcmil, Copper)
40 ft

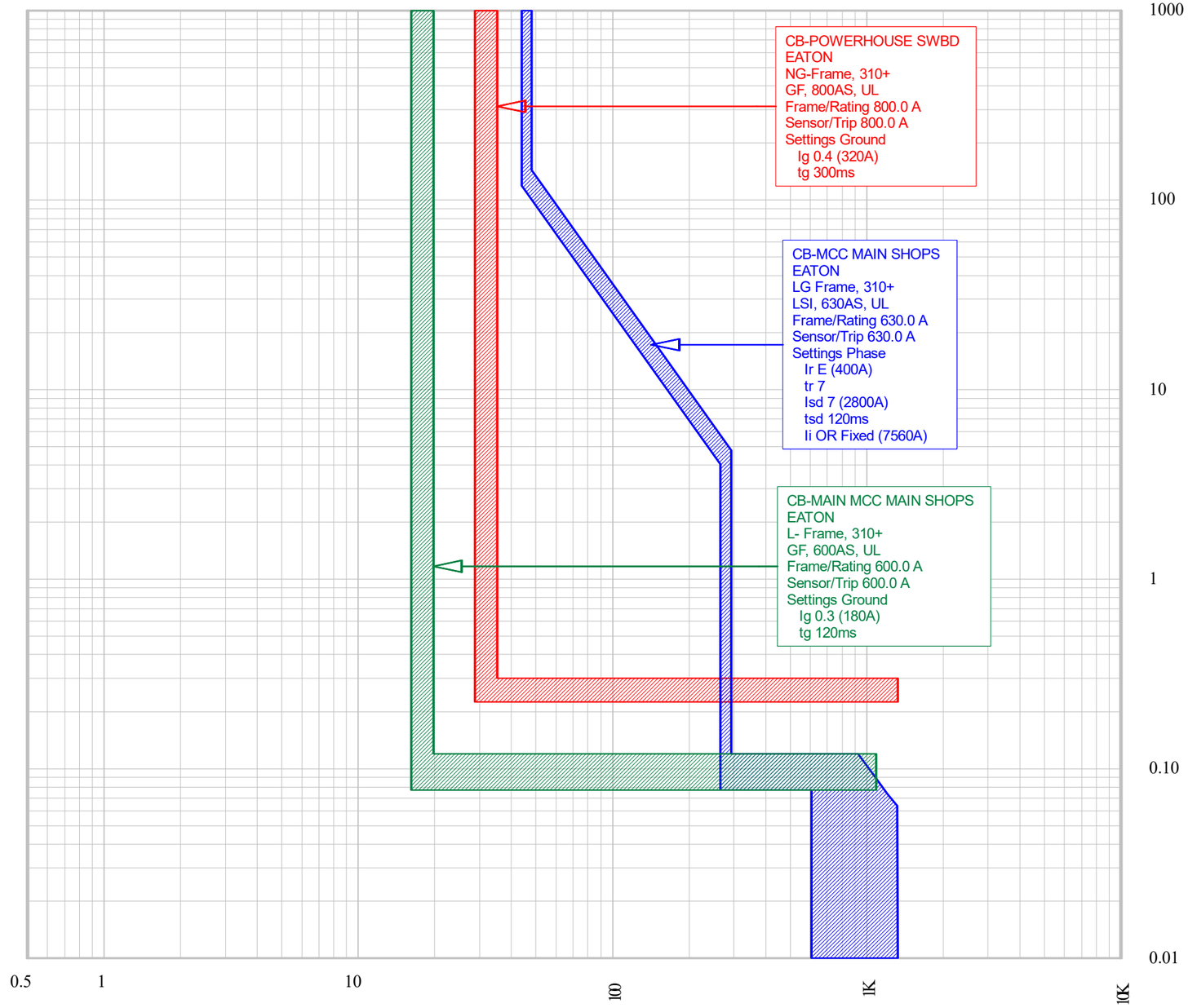
BUNKHOUSE WAYSIDE
LV 3P 24.23 kA, X/R=3.77
LV SLG 25.23 kA, X/R=3.19

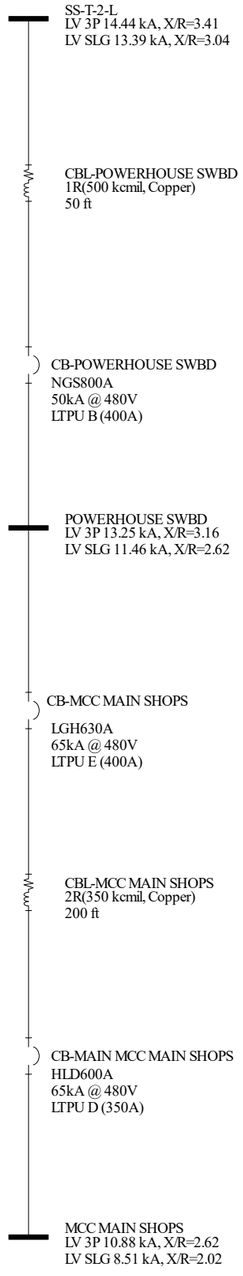
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 16) FU-TX-WAYSIDE to CB-BUNKHOUSE WAYSIDE
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 100
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



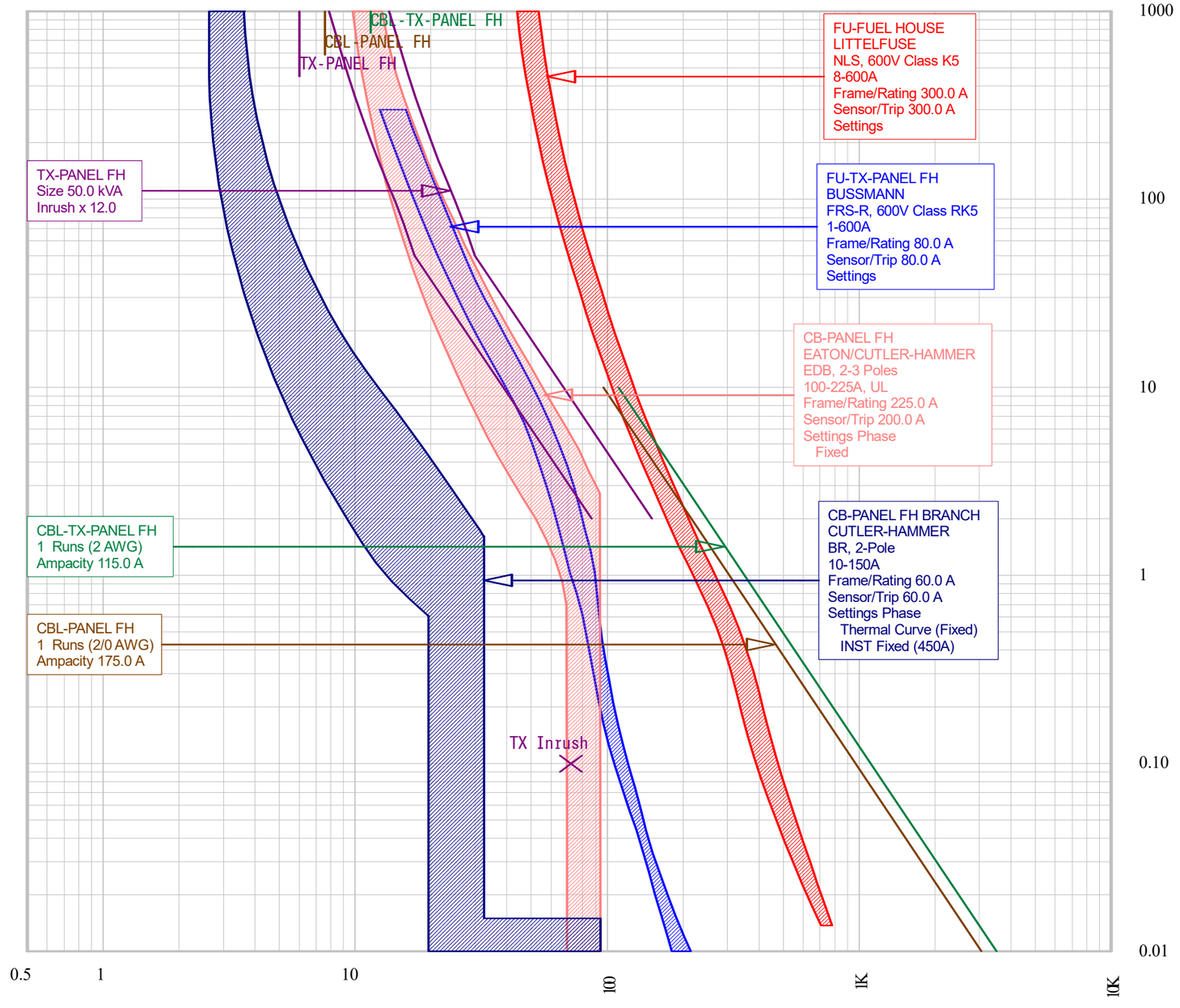


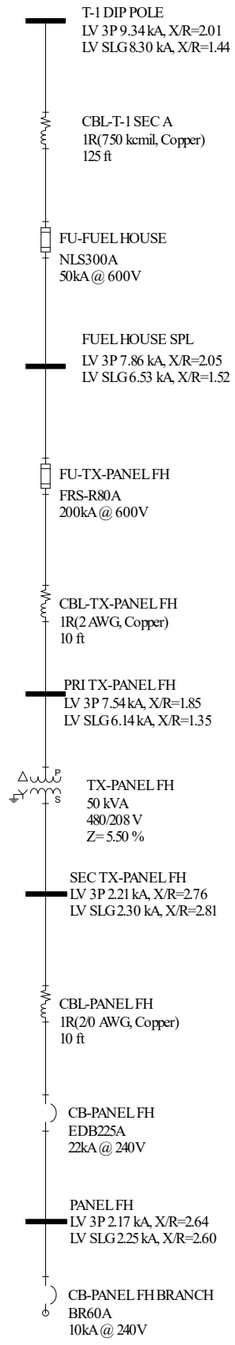
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 17) GROUND CB-POWERHOUSE SWBD to CB-MAIN MCC MAIN SHOPS
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



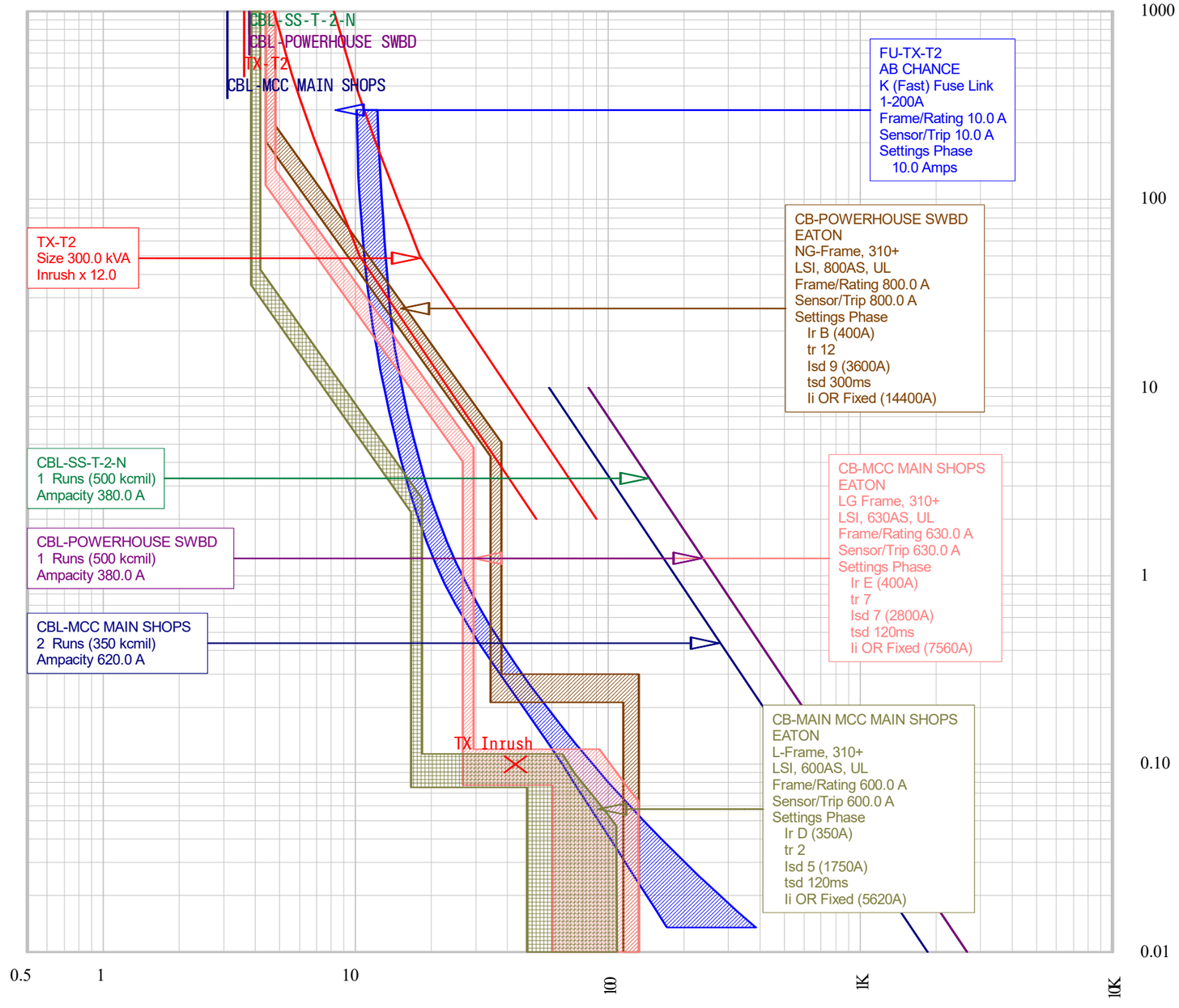


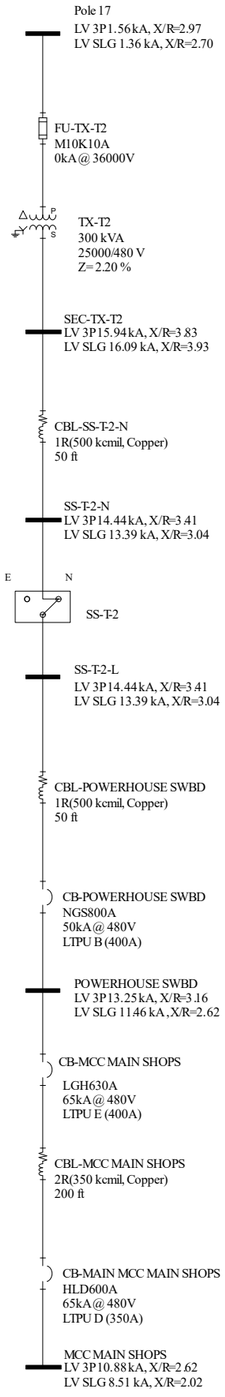
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 18) FU-FUEL HOUSE to CB-PANEL FH BRANCH
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



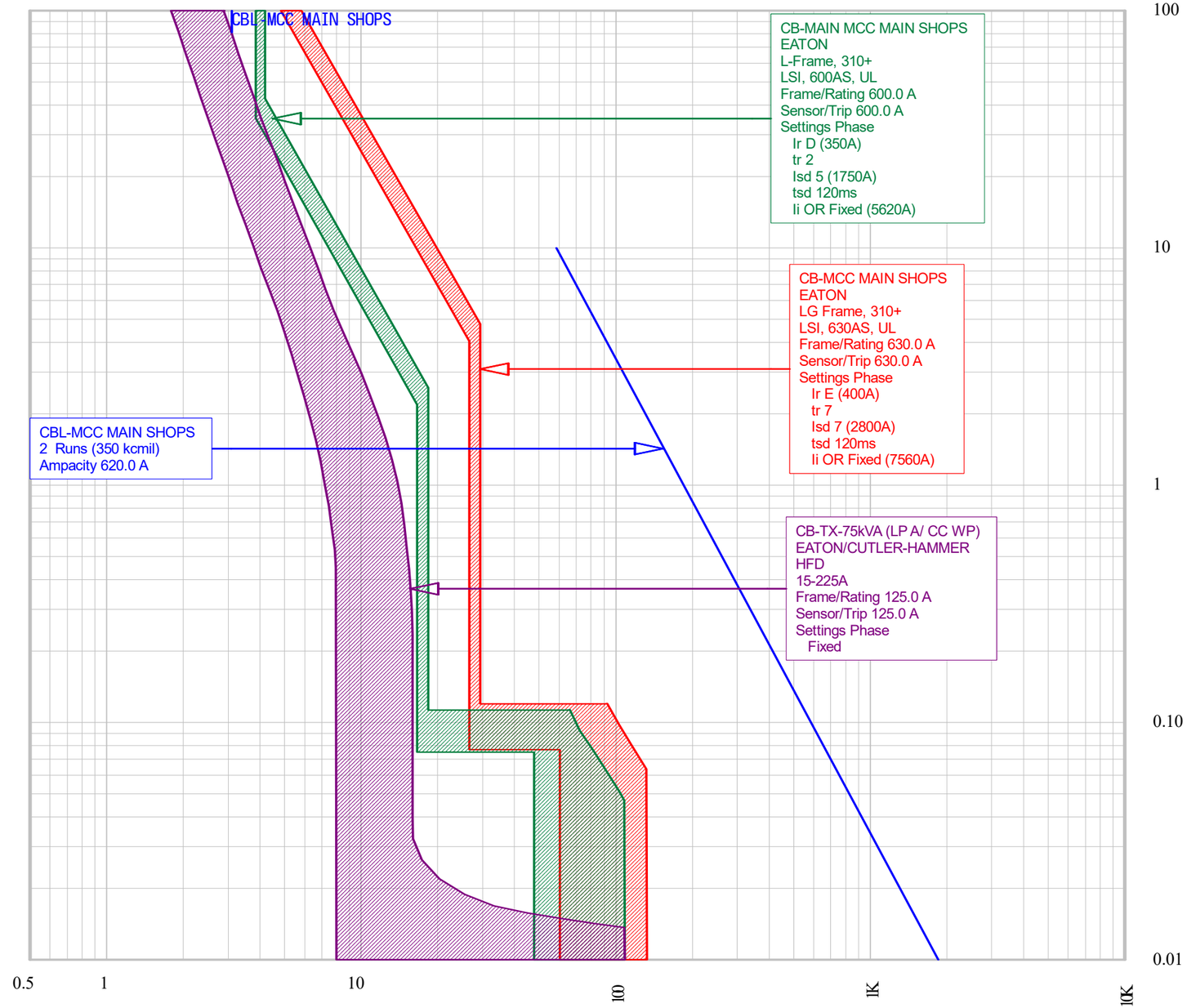


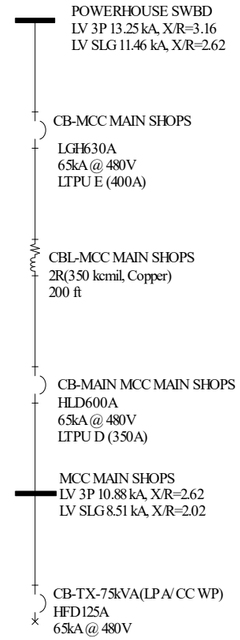
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TCC: 19)FU-TX-T2 to CB-MCC MAIN SHOPS
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 100
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



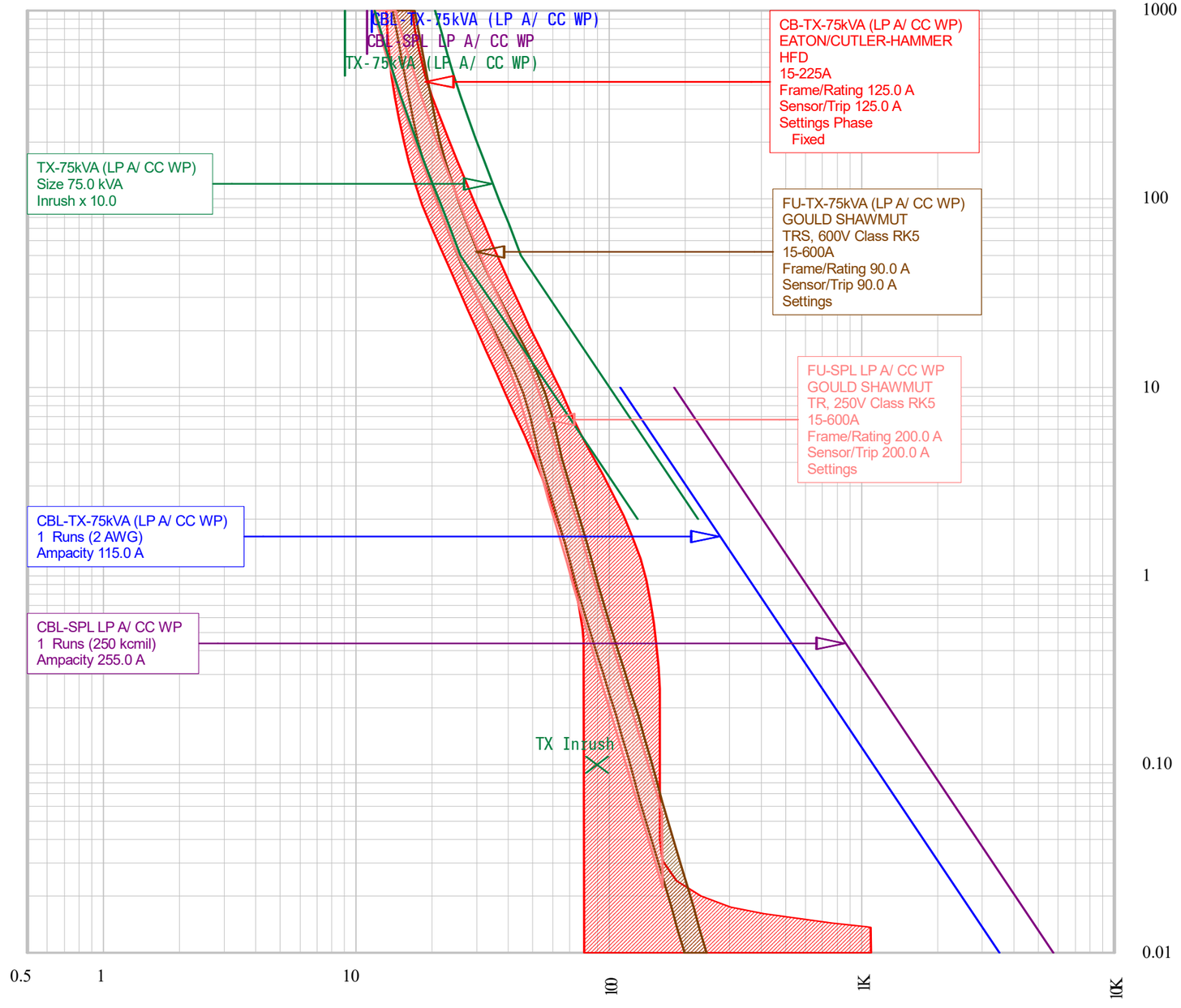


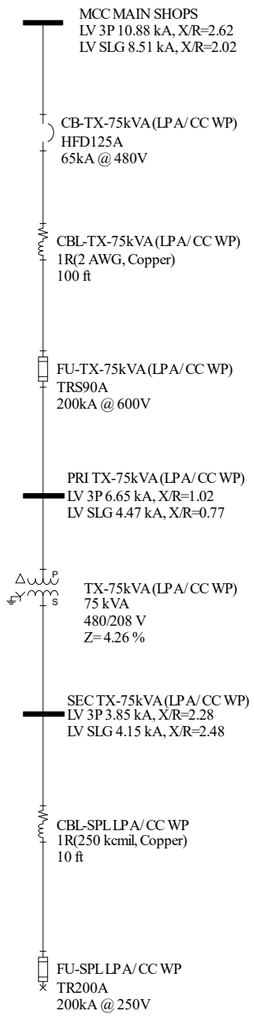
QUALUS SERVICES CANADA LTD.
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TCC: 20) CB-MCC MAIN SHOPS to CB-TX-75kVA (LP A, CC WP)
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 100
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



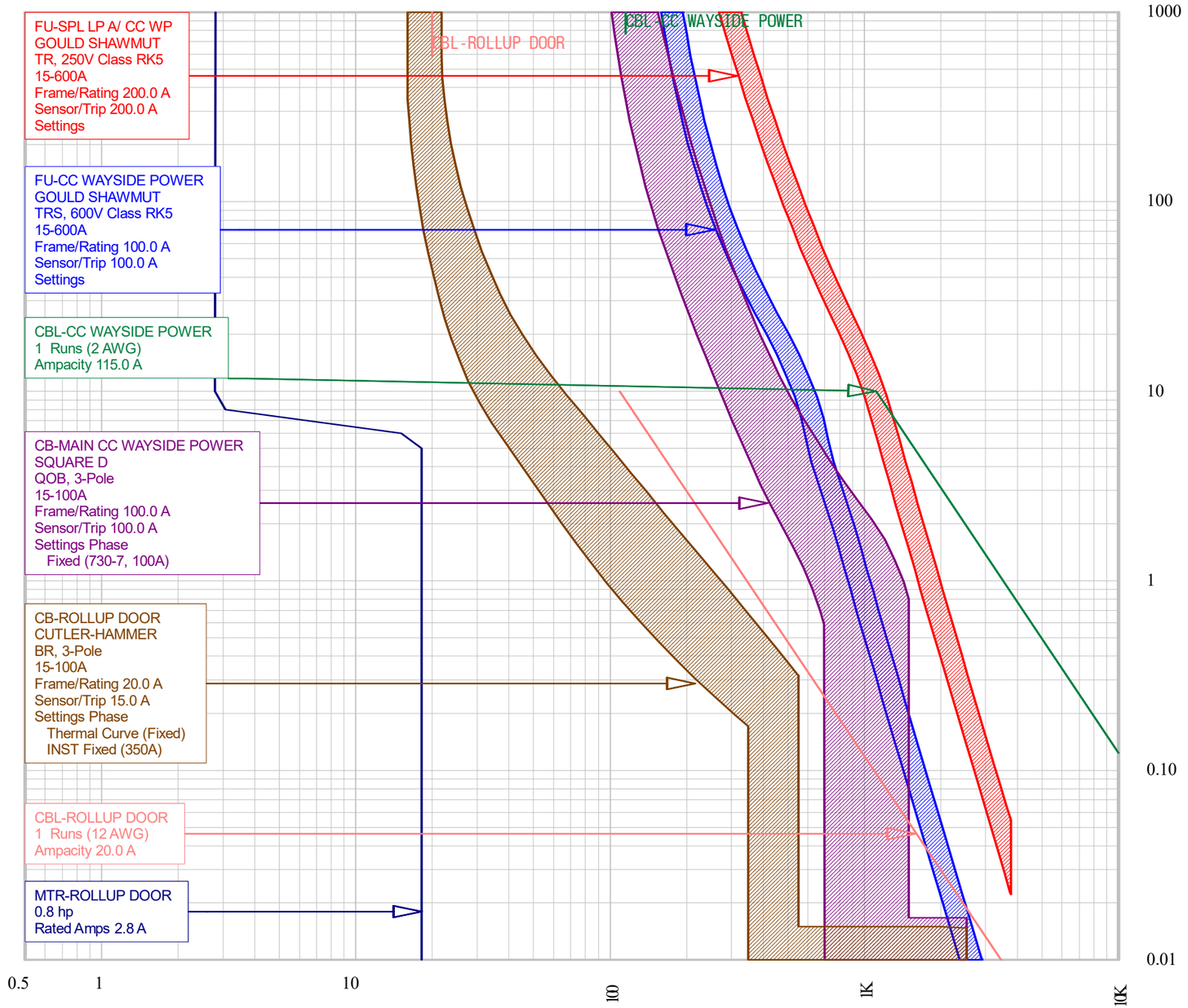


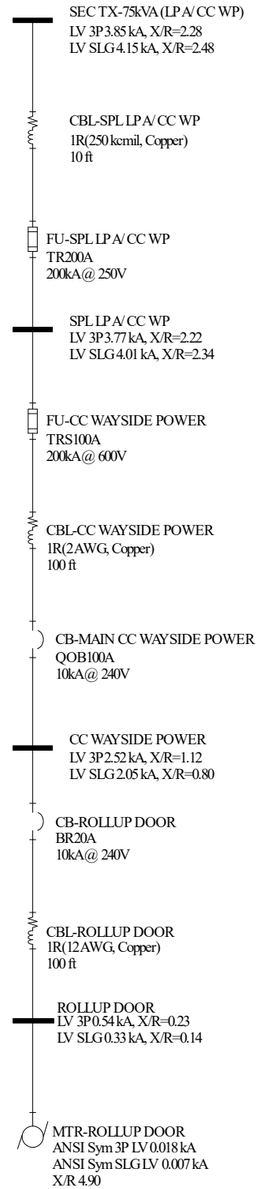
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TCC: 21) CB-TX-75kVA (LP A, CC WP) to FU-SPL LP A, CC WP
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



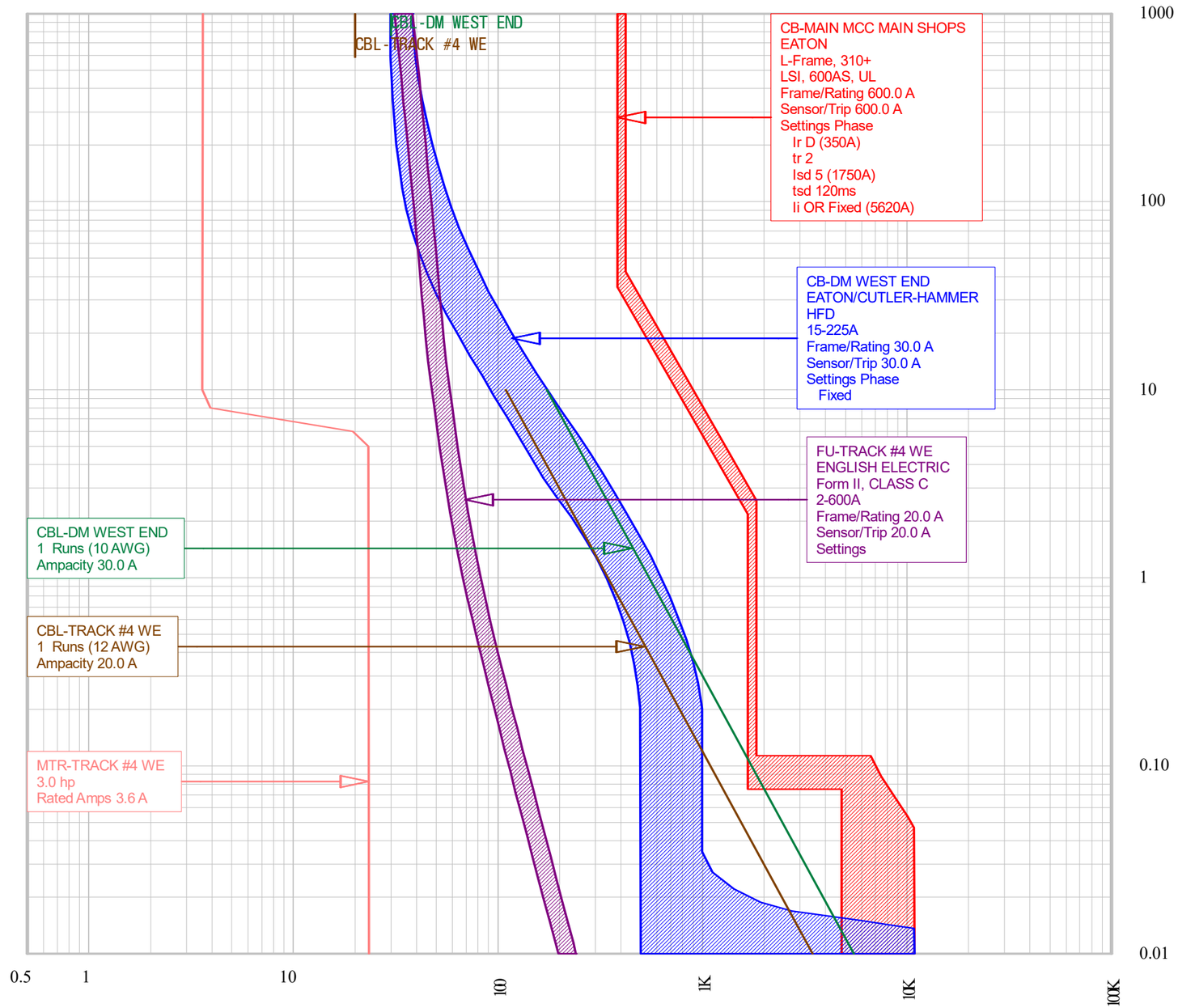


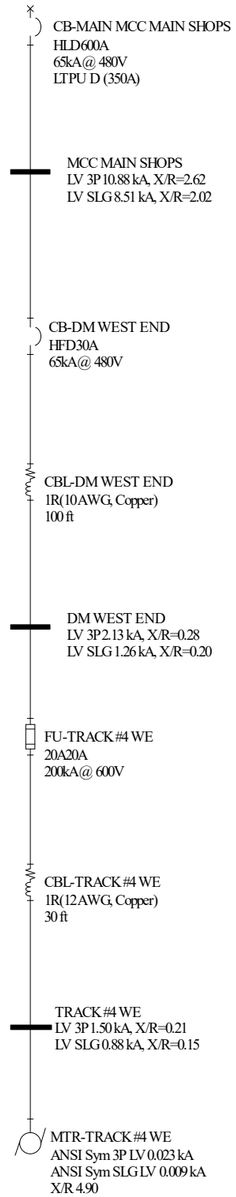
QUALUS SERVICES CANADA LTD.
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TCC: 22) FU-SPL LP A, CC WP to MTR-ROLLUP DOOR
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 1
Reference Voltage: 208V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



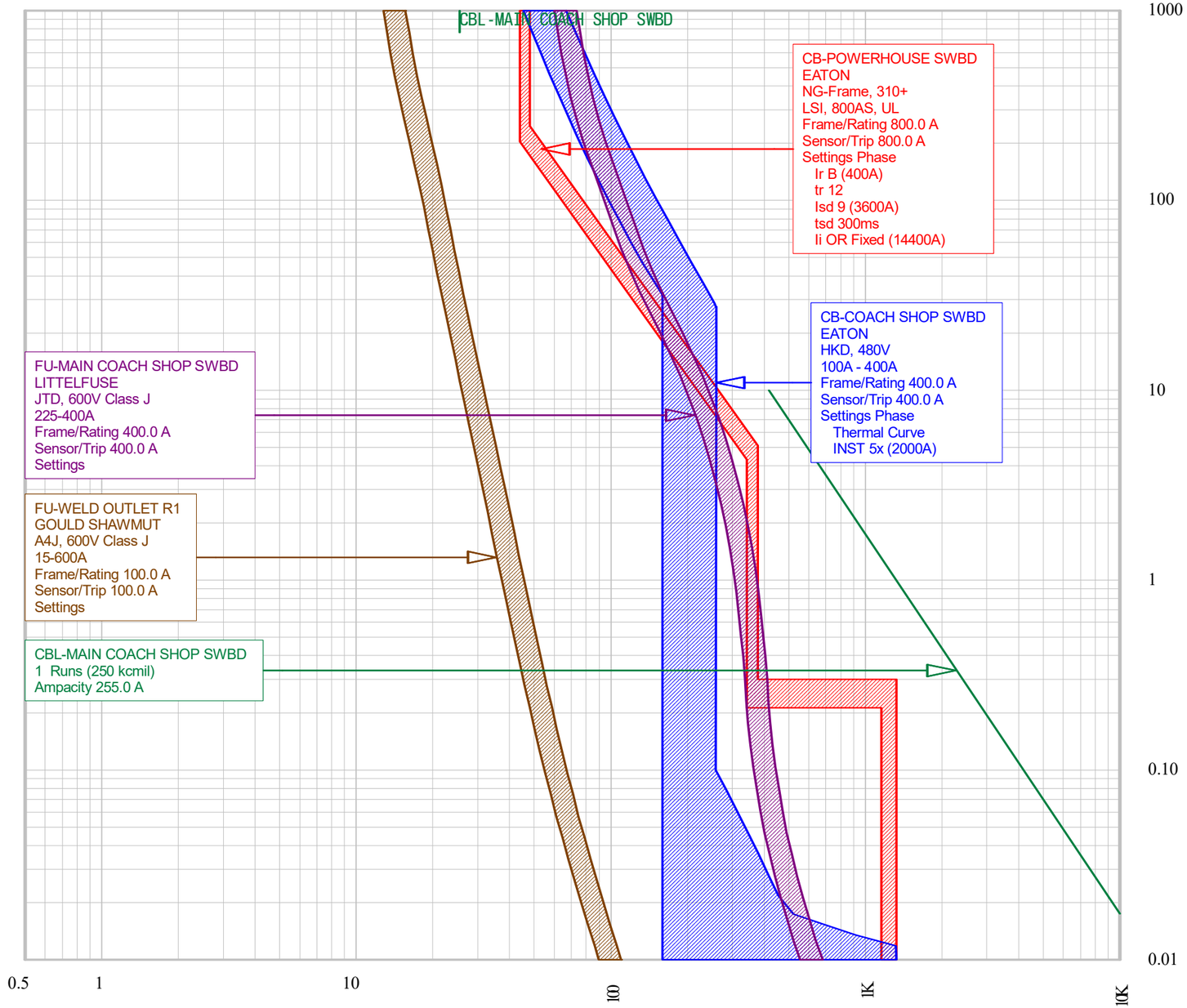


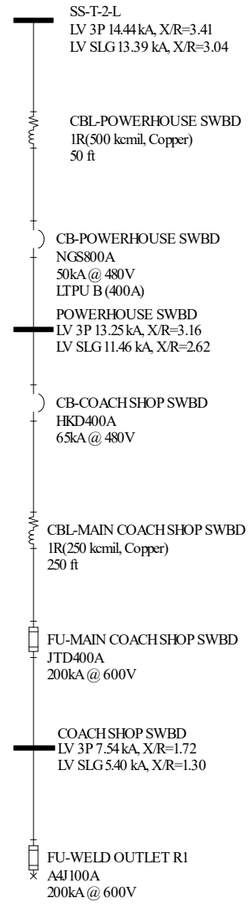
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 23) CB-MAIN MCC MAIN SHOPS to MTR-TRACK #4 WE
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 1
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.



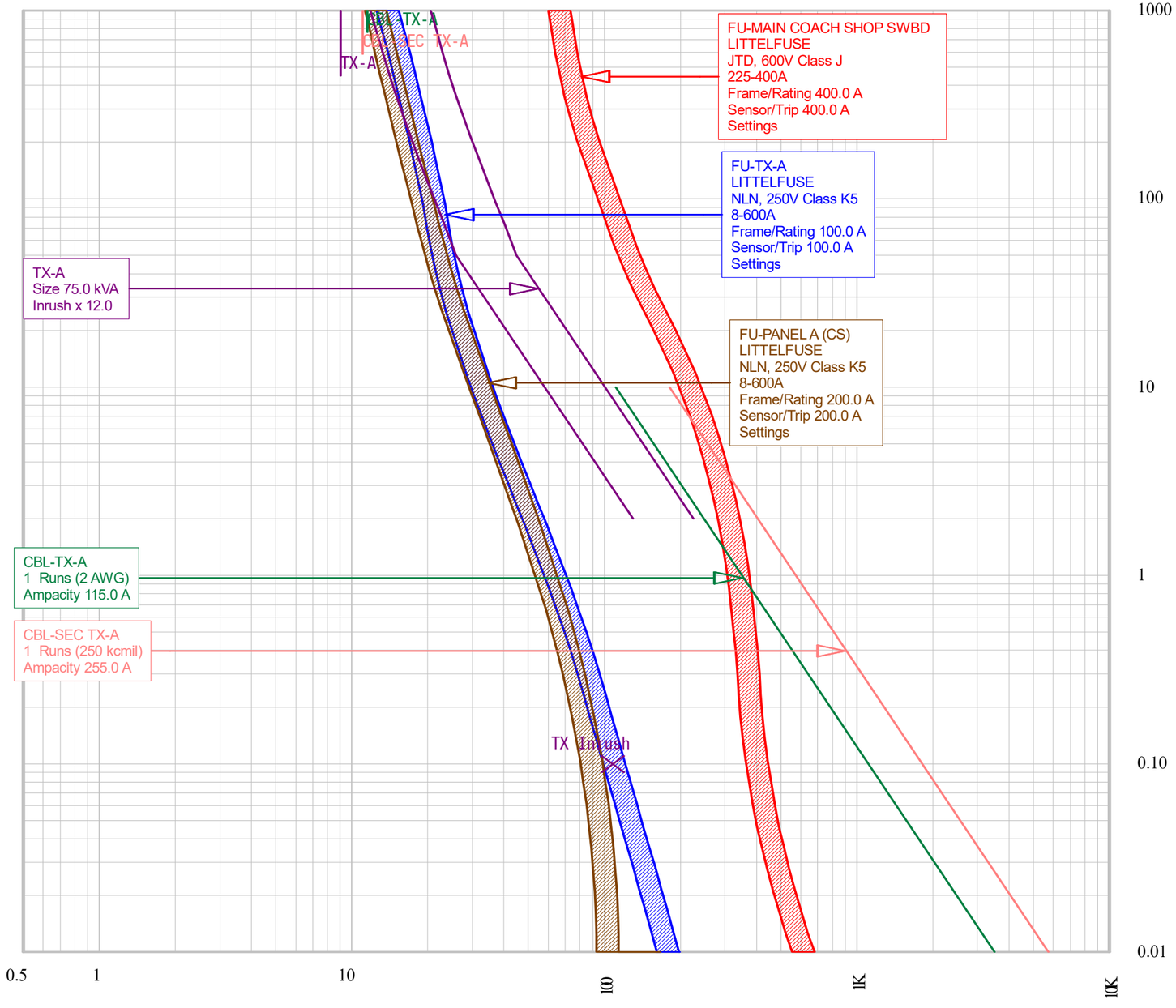


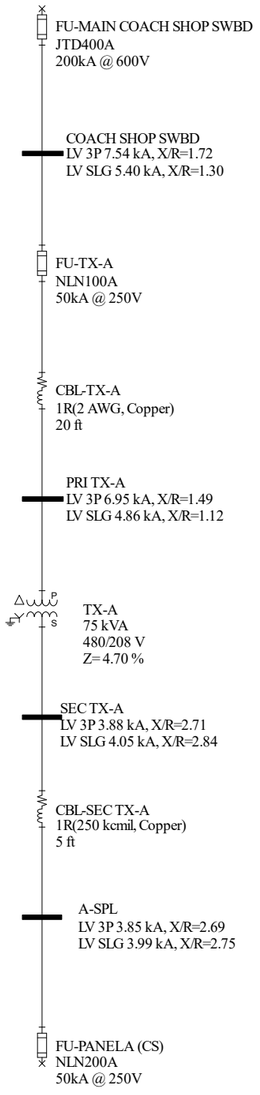
QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

TCC: 24) CB-POWERHOUSE SWBD to FU-WELD OUTLET R1
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.





QUALUS SERVICES CANADA LTD.
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TCC: 25) FU-MAIN COACH SHOP SWBD to FU-PANEL A (CS)
Scenario: As Recommended Settings
Project # ENK-25-16394
Project:: Ontario Northland Cochrane Site

Current in Amps x 10
Reference Voltage: 480V

December 31, 2025
By: Kimberly Chigbo
Qualus Services Canada Ltd.

4.3 Protective Device Settings Table

QUALUS SERVICES CANADA LTD.
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ADJUSTABLE LOW VOLTAGE CIRCUIT BREAKER OVERCURRENT SETTINGS TABLE

Ontario Northland Cochrane Site

ENK-25-16394

31-Dec-25

CONNECTED BUS	DEVICE NAME	BUS VOLTAGE	DEVICE VOLTAGE	MANUFACTURER	BREAKER TYPE	FRAME MODEL	FRAME SIZE	TRIP UNIT MODEL	TRIP	PLUG	LTPU	LTD	STPU	STD	I^2 T	INST	GFPU	GFD	GF I^2 T
LP A	CB-MAIN LP A	208.0V	240	FPE	Thermal Magnetic	225	225A	NEJ	200A	200A						LO (1170A)			
LP F	CB-LP F	208.0V	240	FPE	Thermal Magnetic	125	125A	NEJ	125A	125A						LO (731.25A)			
LP G	CB-LP G	208.0V	240	FPE	Thermal Magnetic	225	225A	NEJ	150A	150A						HI (1425A)			
LP J	CB-MAIN LP J	208.0V	240	FPE	Thermal Magnetic	125	125A	NEJ	100A	100A						LO (585A)			
LP K	CB-MAIN LP K	208.0V	240	FPE	Thermal Magnetic	225	225A	NEJ	150A	150A						HI (1425A)			
MAIN BKR CSI	CB-LPI (COMMON AREA)	600.0V	600	FPE	Thermal Magnetic	CF	250A	CF	200A	200A						5 (1000A)			
MAIN BKR CSI	CB-MAIN CSI	600.0V	600	FEDERAL PACIFIC	Thermal Magnetic	NM	800A	NM & HM, 2-3 Pole	800A	800A						3750 (3750A)			
MAIN BKR CSI	CB-MOTEL AREA	600.0V	600	FPE	Thermal Magnetic	CF	250A	CF	200A	200A						10 (2000A)			
MAIN BKR CSI	CB-ONR AREA	600.0V	600	FPE	Thermal Magnetic	CF	250A	CF	225A	225A						10 (2250A)			
MAIN SHOP PNL	CB-MAIN SHOP PNL	240.0V	240	EATON	Static Trip	CLD	600A	L-Frame, 310+	600A	600A	E (400A)	10	7 (2800A)	Inst		Fixed (5620A)			
MCC MAIN SHOPS	CB-MAIN MCC MAIN SHOPS	480.0V	480	EATON	Static Trip	HLD	600A	L-Frame, 310+	600A	600A	D (350A)	2	5 (1750A)	120ms		Fixed (5620A)	0.3 (180A)	120ms	
POWERHOUSE SWBD	CB-COACH SHOP SWBD	480.0V	480	EATON	Thermal Magnetic	HKD	400A	HKD, 480V	400A	400A						5x (2000A)			
POWERHOUSE SWBD	CB-MCC MAIN SHOPS	480.0V	480	EATON	Static Trip	LGH	630A	LG Frame, 310+	630A	630A	E (400A)	7	7 (2800A)	120ms		Fixed (7560A)	0.3 (189A)	120ms	
POWERHOUSE SWBD	CB-POWERHOUSE SWBD	480.0V	480	EATON	Static Trip	NGS	800A	NG-Frame, 310+	800A	800A	B (400A)	12	9 (3600A)	300ms		Fixed (14400A)	0.4 (320A)	300ms	
TS-3-N	CB-TS-3-N	240.0V	240	EATON/CUTLER-HAMMER	Thermal Magnetic	KD	400A	KD	400A	400A						5 (2000A)			
WAYSIDE SWBD	CB-APU WAYSIDE	480.0V	480	Utility Relay Co	Static Trip	RL-800	800A	AC-Pro Retrofit (RL-42kA)	400A	400A	100 % (400A)	3	5 (2000A)	0.07	(I^s T Off)	8 (3200A)			
WAYSIDE SWBD	CB-BUNKHOUSE WAYSIDE	480.0V	480	Utility Relay Co	Static Trip	RL-800	800A	AC-Pro Retrofit (RL-42kA)	800A	800A	0.75 (600A)	2.5	5 (3000A)	0.07	(I^s T Off)	7.5 (4500A)			
WAYSIDE SWBD	CB-TRACK1 WAYSIDE	480.0V	480	Utility Relay Co	Static Trip	RL-800	800A	AC-Pro Retrofit (RL-42kA)	800A	800A	0.75 (600A)	2.5	1200 % (7200A)	0.1	(I^s T Off)				
WAYSIDE SWBD	CB-TRACK2 WAYSIDE	480.0V	480	Utility Relay Co	Static Trip	RL-800	800A	AC-Pro Retrofit (RL-42kA)	800A	800A	0.5 (400A)	3.5	4 (1600A)	0.2	(I^s T Off)	11.25 (4500A)			
WAYSIDE SWBD	CB-TRACK3 WAYSIDE	480.0V	480	Utility Relay Co	Static Trip	RL-800	800A	AC-Pro Retrofit (RL-42kA)	800A	800A	0.5 (400A)	3.5	4 (1600A)	0.2	(I^s T Off)	11.25 (4500A)			
WAYSIDE SWBD	CB-TRACK4 WAYSIDE	480.0V	480	Utility Relay Co	Static Trip	RL-800	800A	AC-Pro Retrofit (RL-42kA)	800A	800A	0.5 (400A)	3.5	5 (2000A)	0.07	(I^s T Off)	1200 % (4800A)			

Legend

Recommended Settings

5 Arc Flash Hazard Analysis

An arc-flash hazard analysis determines the arc-flash protection boundary around electrical equipment within which a worker exposed to an arcing fault would expect to receive 2nd or higher degree burns if not adequately protected. The analysis also determines the arc flash incident energy (AFIE) level at a specific working distance from equipment. The calculated AFIE should be used by referring to Table 2 of CSA Z462-2024 [1] to select appropriate personal protective equipment (PPE) to be worn when performing a task that presents an arc flash hazard within the arc flash protection boundary. Table 2 of CSA Z462-2024 [1] must be used by workers to determine if any of the tasks they are performing qualify as arc flash hazards that require arc flash PPE. The calculations made in this analysis conform to CSA Z462-2024 [1] and IEEE-1584 [7] Edition, which provide the equations and methods to calculate the arc-flash boundary and incident energy and determine the required category of the personal protective equipment.

Table 5.1: Summary of Standards Used to Calculate Arc Flash Incident Energy

Arc Flash Calculation Method Criteria	Arc Flash Calculation Method	CSA Z462 Reference
• 208 V to 15 kV • 3-Phase • 50 Hz or 60 Hz • Available fault current (rms symmetrical) ▸ 500 A to 106 kA (208 V to 600 V) ▸ 200 A to 64 kA (601 V to 15 kV) • Conductor gaps ▸ 6.35 mm to 7.63 mm (208 V to 600 V) ▸ 19.05 mm to 254 mm (601 V to 15 kV)	IEEE-1584-2018	CSA-Z462 Annex D.4
• < 1000 V • DC	Maximum Power Method (Doan-2010)	CSA-Z462 Annex D.5
• Arc in Open Air • Used when equipment requires incident energy calculation and is outside the applicable ranges of the other listed methods	Lee-1982	CSA-Z462 Annex D.2

The calculation methods listed in the above tables provide the equations and methods to calculate the arc-flash boundaries and incident energies.

The AFIE calculations take into account the following factors:

- Maximum bolted fault current and the minimum fault level at which the arc will self-sustain
- Electrode configuration and enclosure dimensions - For switchboards, switchgears, and other enclosures not described as a panel will use the HCB configuration and all panelboards will use the VCBB configuration
- Working Distance – the distance a worker is standing from an exposed conductor
- Total protective device clearing time – the length of time it takes for the upstream protective device to clear the fault. The faster the clearing time, the lower the incident energy will be

The SKM software calculates firstly the arcing fault current at each bus in the system based on the available bolted fault current determined during the short circuit analysis and applicable equations in referenced arc flash incident energy calculation method. Then, the duration of the arc is determined from the time-current characteristics of the applicable overcurrent devices and the calculated arc fault current. Once the arcing fault current and fault duration are known, equations from the applicable arc flash calculation method are used to calculate the available arc-flash incident energy (AFIE) and arc-flash protection boundary for each location under study. The calculated AFIE levels are also based on the "working distance" from the fault.

Two separate arc-flash hazard calculations were performed:

- The "BUS" calculation, where the arc-flash incident energy and protection boundaries were computed at each bus in the system based on the characteristics of the overcurrent protective device upstream of the bus - for example, the main breaker in the switchboard, which is assumed to clear any fault on the switchboard bus, and
- The "LINE SIDE" calculation, where the arc-flash incident energy and protection boundary were computed at each bus in the system based on the characteristics of the bus next upstream protective device (the fault is assumed to be on the line side of the bus immediate upstream protective device and the bus next upstream protective device clearing the fault).

In most cases, the "BUS" calculation will be the most applicable. However, in certain cases, it is possible that the fault may occur or propagate to the line-side of the local protective device. In these cases, the results of the "LINE SIDE" calculation are applicable.

Assumptions:

- The protective devices engineered in the study are assumed to be working within their specified tolerances to clear faults from the system.
- A working distance of 24 inches was assumed for low-voltage switchgear, 18 inches for Low-voltage MCC's and Panel boards and 36 inches for Medium Voltage equipment, per IEEE Std. 1584's recommendations.
- The maximum arcing duration is considered to be 2 seconds, as per the IEEE Std. 1584's suggestion.
- Equipment 240V and below are not considered arc flash hazards unless they have an available fault current greater than 2,000A (typically when fed from a 45kVA or larger transformer) as per IEEE 1584 [7].

5.1 Analysis of Results and Recommendations

The arc-flash calculations were performed for the following scenarios:

Table 5.2: Arc Flash Scenarios

Scenario Number	Utility	Generator	Motors
0	MAX	GEN ATS NORMAL	ON
1	MIN	GEN ATS EMERGENCY	OFF

The results of all scenarios were combined into one composite table showing the worst-case results for each piece of equipment evaluated.

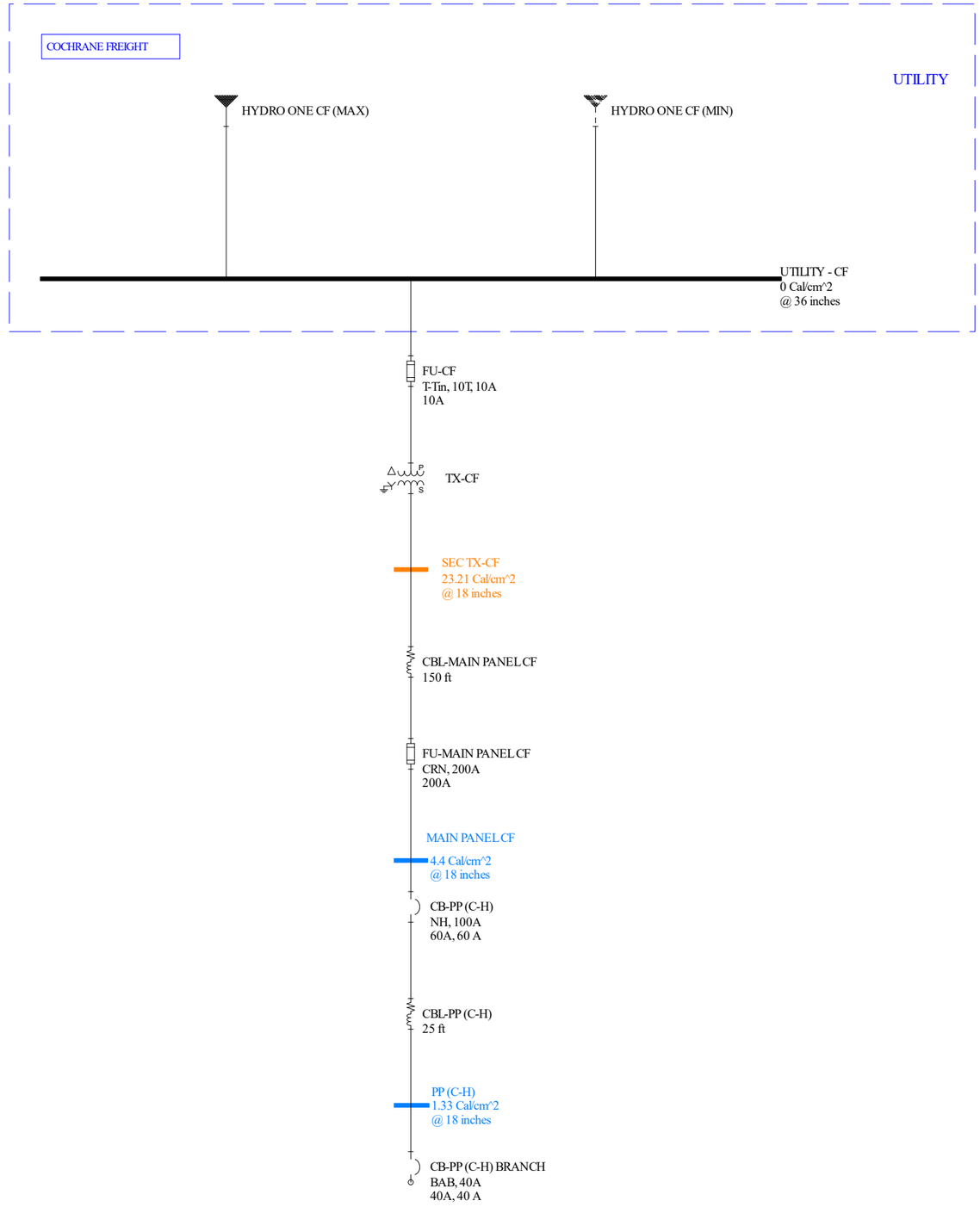
The results of the arc flash incident energy calculations for the settings, calculated for a total number of 231 buses, as described below. Table 5.3 subdivides the calculated AFIE results into four (4) ranges to cross-reference with CSA Z462 [1] Table 2 and the end user's maximum available PPE options described as the Target Maximum AFIE. Most established safety policies in the electrical industry recommend extreme caution for any activity that may require arc flash PPE on equipment that has calculated AFIE greater than 40 cal/cm². This is usually done to address the user's maximum arc flash PPE ratings and the limitations of most arc flash PPE in protecting workers from the hazards other than heat that they are likely to be exposed to during an arc flash event such flying debris, blast percussion, and toxic fumes absorption/inhalation. However, the Target Maximum AFIE is not a requirement of CSA Z462 [1] or IEEE 1584 [7]. The decision utilizes the Target Maximum AFIE provided in the following table is determined by the end user and the appropriate safety policies that worker must be adhere to when completing the tasks.

Table 5.3: Arc Flash Summary

Calculated Arc Flash Incident Energy	Recommended
Less than 1.2 cal/cm^2	149
Greater than 1.2 cal/cm^2 and Less than or Equal to 12 cal/cm^2	76
Greater than 12.0 cal/cm^2 and less than or equal to 40 cal/cm^2	6
Greater than 40 cal/cm^2	0

Table 5.3 illustrates the arc flash incident energies due to the recommended settings for the adjustable overcurrent protective devices. In most cases the table shows that the AFIE could be mitigated by adjusting the overcurrent settings of the protective devices installed in the system.

5.2 Arc Flash Hazard Analysis Table: Recommended Settings

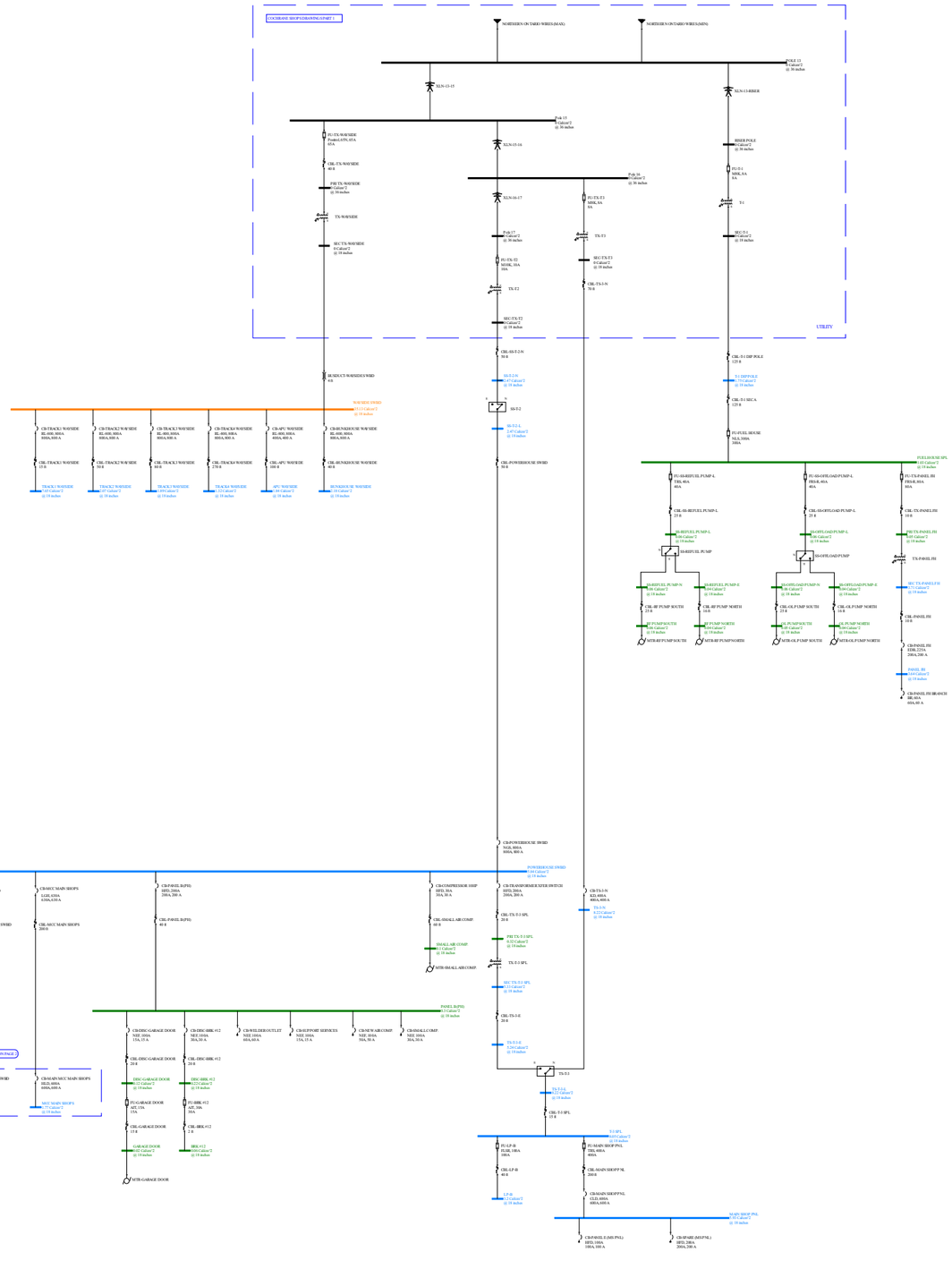


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Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CF
Scenario: As Recommended Settings
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

NOTE:
Arc flash values shown in this single-line diagram are approximate representations of the calculated arc flash incident energy values and may not represent the Worst Case Arc Flash Incident Energy for every bus. The Arc Flash Incindent Energy table in this section must be consulted to obtain the worst case Arc Flash Incident Energy values.

By: Kimberly Chigbo
Qualus Services Canada Ltd.
December 31, 2025


TOUCHDOWN: 600 (P3 OR600NG) (START 1)
NORTHERN ON TARKO WIRES (6AX)
NORTHERN ONTARIO WIRES (6MN)
POLE 15
Cal
@ 30 inches
XLN-13-15
XLN-13-RISER
Pole 17
Cal
@ 30 inches
RISER POLE
Cal
@ 30 inches
FU-TX-WSIDE
Poste
6.6TK, 65A
65A
XLN-15-16
FU-TX-1
600L, 8A
8A
CBL-TX-WSIDE
40 ft
Pole 16
Cal
@ 30 inches
PSE TX-WSIDE
Cal
@ 30 inches
XLN-16-17
FU-TX-E1
600L, 8A
8A
T-1
TX-WSIDE
Pole 17
Cal
@ 30 inches
TX-T1
SEC-TX-1
4/0
@ 19 inches
SEC TX-WSIDE
4/0
@ 19 inches
FU-TX-T2
MJ6L, 10A
10A
SEC-1
Cal
@ 19 inches
TX-T2
SEC-TX-T2
Cal
@ 19 inches
CBL-SEC-1-2-N
50 ft
UTILITY
XLN-2-N
Cal
@ 19 inches
CBL-1-DIP POLE
125 ft
1-1 DIP POLE
Cal
@ 19 inches
SS-T-2
CBL-1-1 SEC-A
125 ft
FU-FUEL HOUSE
NGL, 100A
100A
BUSBAR-2
Cal
@ 19 inches
CBL-POWERHOUSE SWBD
50 ft
FU-SS-REFUEL PUMP-L
TBD, 40A
40A
PULLBOX/SE SPL
Cal
@ 19 inches
CB-TRACK1 WSIDE
EL-60L, 80DA
800A, 800 A
CB-TRACK2 WSIDE
EL-60L, 80DA
800A, 800 A
CB-TRACK3 WSIDE
EL-60L, 80DA
800A, 800 A
CB-TRACK4 WSIDE
EL-60L, 80DA
800A, 800 A
CB-4PU WSIDE
EL-60L, 80DA
400A, 400 A
CB-HUNKHOUSE WSIDE
EL-60L, 80DA
800A, 800 A
CBL-TRACK1 WSIDE
135 ft
CBL-TRACK2 WSIDE
50 ft
CBL-TRACK3 WSIDE
60 ft
CBL-TRACK4 WSIDE
270 ft
CBL-4PU WSIDE
180 ft
CBL-HUNKHOUSE WSIDE
40 ft
WSIDE SWBD
Cal
@ 19 inches
TRACK1 WSIDE
Cal
@ 19 inches
T.TRACK2 WSIDE
Cal
@ 19 inches
TRACK3 WSIDE
Cal
@ 19 inches
TRACK4 WSIDE
Cal
@ 19 inches
4PU WSIDE
Cal
@ 19 inches
HUNKHOUSE WSIDE
Cal
@ 19 inches
FU-SS-REFUEL PUMP-E
TBD, 40A
40A
FU-SS-OFFLOAD PUMP-L
MJ6L, 40A
40A
FU-SS-OFFLOAD PUMP-E
MJ6L, 40A
40A
FU-TX-PANEL FH
MJ6L, 80A
80A
CBL-SS-REFUEL PUMP-L
25 ft
CBL-SS-OFFLOAD PUMP-L
25 ft
CBL-TX-PANEL FH
20 ft
SS-REFUEL PUMP-L
Cal
@ 19 inches
SS-OFFLOAD PUMP-L
Cal
@ 19 inches
TS-PANEL FH
Cal
@ 19 inches
SS-REFUEL PUMP
SS-OFFLOAD PUMP
TS-PANEL FH
SEC TX-PANEL FH
Cal
@ 19 inches
SS-REFUEL PUMP-N
Cal
@ 19 inches
SS-REFUEL PUMP-E
Cal
@ 19 inches
SS-OFFLOAD PUMP-N
Cal
@ 19 inches
SS-OFFLOAD PUMP-E
Cal
@ 19 inches
CBL-PANEL FH
10 ft
CBL-SE PUMP SOUTH
25 ft
CBL-SE PUMP NORTH
10 ft
CBL-OL PUMP SOUTH
25 ft
CBL-OL PUMP NORTH
10 ft
PANEL FH
Cal
@ 19 inches
SE PUMP SOUTH
Cal
@ 19 inches
SE PUMP NORTH
Cal
@ 19 inches
OL PUMP SOUTH
Cal
@ 19 inches
OL PUMP NORTH
Cal
@ 19 inches
CB-PANEL FH
83kR, 225A
200A, 200 A
MTR-SE PUMP SOUTH
MTR-SE PUMP NORTH
MTR-OL PUMP SOUTH
MTR-OL PUMP NORTH
PANEL FH
Cal
@ 19 inches
CB-PANEL FH BRANCH
8R, 60A
60A, 60 A
CB-POWERHOUSE 8WBD
NGL, 800A
800A, 800 A
POWERHOUSE SWBD
Cal
@ 19 inches
CB-COMPRESSOR FUTURE
SJT5, 70A
70A, 70 A
CB-DISC-8RG-AIR COMPRESSOR
SJT5, 60A
60A, 60 A
CB-DISC-COMPRESSOR 2/3HP
SJT5, 60A
60A, 60 A
CB-COACH SHOP SWBD
HKD, 400A
400A, 400 A
CB-MUC MAIN SHOPS
LGH, 630A
630A, 630 A
CB-PAWIL B(P10)
SJT5, 100A
200A, 200 A
CB-COMPRESSOR 10HP
SJT5, 30A
30A, 30 A
CB-TRANSFORMER/EXFER SWITCH
SJT5, 200A
200A, 200 A
CB-TS-1-N
KD, 600A
600A, 600 A
CBL-COMPRESSOR FUTURE
40 ft
CBL-DISC-8RG-AIR COMP RESSOR
40 ft
CBL-DISC-COMPRESSOR
40 ft
CBL-COACH SHOP SWBD
250 ft
CBL-MAIN-COACH SHOP SWBD
250 ft
CBL-MUC MAIN SHOPS
200 ft
CBL-PAWIL B(P10)
40 ft
CBL-COMPRESSOR 10HP
40 ft
CBL-SMALL AIR COMP
60 ft
CBL-TS-1-N
20 ft
TN-1-N
Cal
@ 19 inches
COMPRESSOR FUTURE
Cal
@ 19 inches
DISC-8RG-AIR COMPRESSOR
Cal
@ 19 inches
DISC-COMPRESSOR
Cal
@ 19 inches
SMALL AIR COMP
Cal
@ 19 inches
PW-TX-T-1 SPL
Cal
@ 19 inches
MTR-COMPRESSOR FUTURE
FU-8RG-AIR COMPRESSOR
3/2.5kVI, 45A
45A
FU-COMPRESSOR
AJT, 30A
30A
MTR-SMALL AIR COMP
TX-T-1 SPL
SEC TX-T-1 SPL
Cal
@ 19 inches
CBL-8RG-AIR COMPRESSOR
25 ft
CBL-COMPRESSOR
20 ft
CBL-TS-1-E
20 ft
8RG AIR COMPRESSOR
Cal
@ 19 inches
COMPRESSOR
Cal
@ 19 inches
TS-T-1-E
Cal
@ 19 inches
MTR-8RG-AIR COMPRESSOR
MTR-COMPRESSOR
TS-T-1
CB-TS-T-1
Cal
@ 19 inches
CBL-T-1 SPL
15 ft
T-1 SPL
Cal
@ 19 inches
CONTINUED ON PAGE
FU-MAIN-COACH SHOP SWBD
FU2, 400A
400A
CB-MAIN MUC MAIN SHOPS
SKJ3, 600A
600A, 600 A
CB-DISC-GARAGE DOOR
NJE, 100A
15A, 15 A
CB-DISC-8RK #12
NJE 100A
20A, 20 A
CB-WELDER OUTLET
NJE 100A
60A, 60 A
CB-SUPPORT SERVICES
NJE 100A
15A, 15 A
CB-NEW AIR COMP
NJE, 100A
70A, 70 A
CB-SMALL COMP.
NJE, 100A
30A, 30 A
CBL-DISC-GARAGE DOOR
20 ft
CBL-DISC-8RK #12
20 ft
DISC-GARAGE DOOR
Cal
@ 19 inches
DISC-8RK #12
Cal
@ 19 inches
FU-GARAGE DOOR
AJT, 15A
15A
FU-8RK #12
AJT, 30A
30A
CBL-GARAGE DOOR
15 ft
CBL-8RK #12
2 ft
GARAGE DOOR
Cal
@ 19 inches
8RK #12
Cal
@ 19 inches
MTR-GARAGE DOOR
FU-LP-H
FLSR, 150A
150A
CBL-MAIN SHOP SWBD
TBD, 400A
400A
CBL-LP-H
40 ft
CBL-MAIN SHOPP NL
200 ft
LP-H
Cal
@ 19 inches
CB-MAIN SHOPP NL
CLD, 600A
600A, 600 A
MAIN SHOP PNL
Cal
@ 19 inches
CB-PAWIL E (MS PNL)
SJT5, 100A
100A, 100 A
CB-SPARE (MSPNL)
SJT5, 20A
20A, 20 A

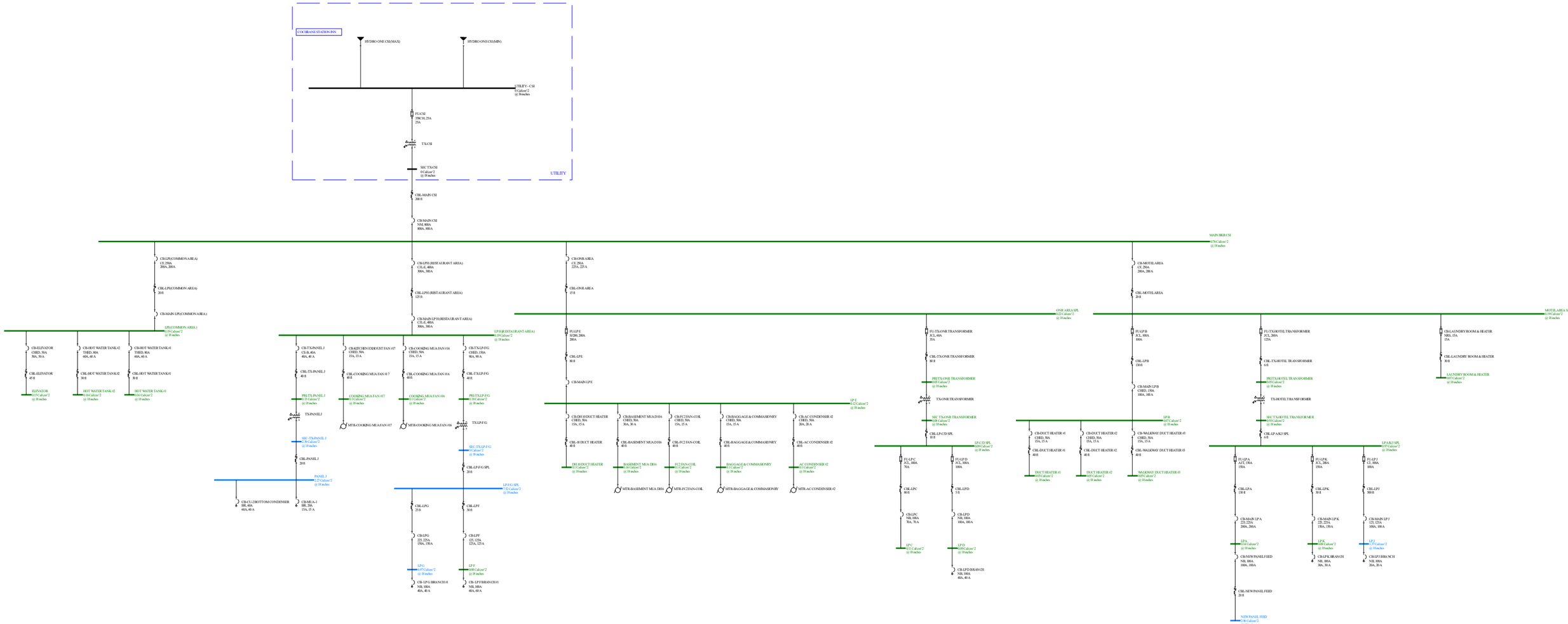


QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CS (PAG
Scenario: As Recommended Settings
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

NOTE:
Arc flash values shown in this single-line diagram are approximate representations of the calculated arc flash incident energy values and may not represent the Worst Case Arc Flash Incident Energy for every bus. The Arc Flash Incindent Energy table in this section must be consulted to obtain the worst case Arc Flash Incident Energy values.

By: Kimberly Chigbo
Qualus Services Canada Ltd.
December 31, 2025

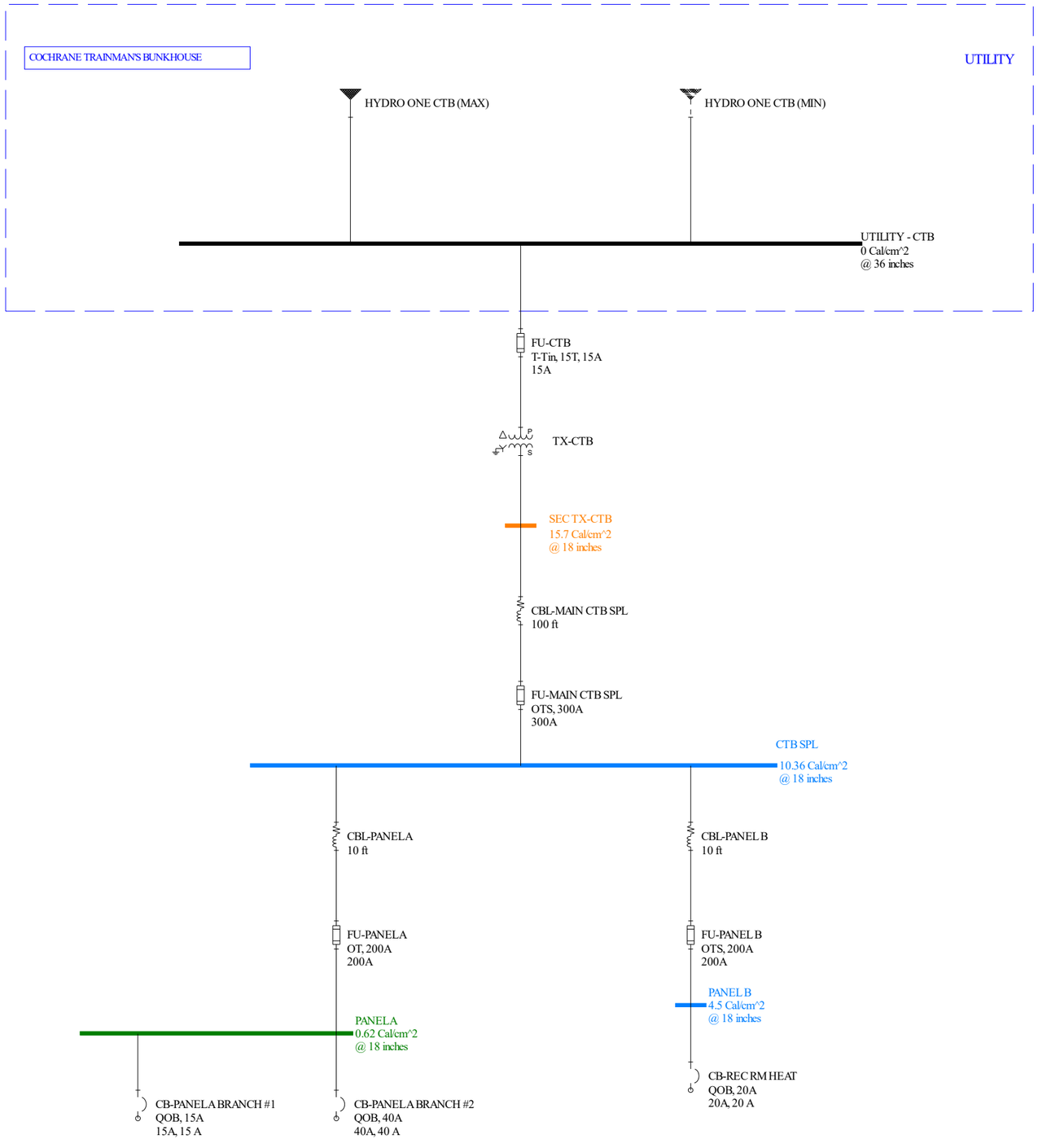


QUALUS SERVICES CANADA LTD.
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Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CSI
Scenario: As Recommended Settings
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

NOTE:
Arc flash values shown in this single-line diagram are approximate representations of the calculated arc flash incident energy values and may not represent the Worst Case Arc Flash Incident Energy for every bus. The Arc Flash Incindent Energy table in this section must be consulted to obtain the worst case Arc Flash Incident Energy values.

By: Kimberly Chigbo
Qualus Services Canada Ltd.
December 31, 2025



QUALUS SERVICES CANADA LTD.
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Drawing: 1 Line - SYSTEM MODEL AND INPUT DATA - CTB
Scenario: As Recommended Settings
Project: Ontario Northland Cochrane Site
Project # ENK-25-16394

NOTE:
Arc flash values shown in this single-line diagram are approximate representations of the calculated arc flash incident energy values and may not represent the Worst Case Arc Flash Incident Energy for every bus. The Arc Flash Incindent Energy table in this section must be consulted to obtain the worst case Arc Flash Incident Energy values.

By: Kimberly Chigbo
Qualus Services Canada Ltd.
December 31, 2025

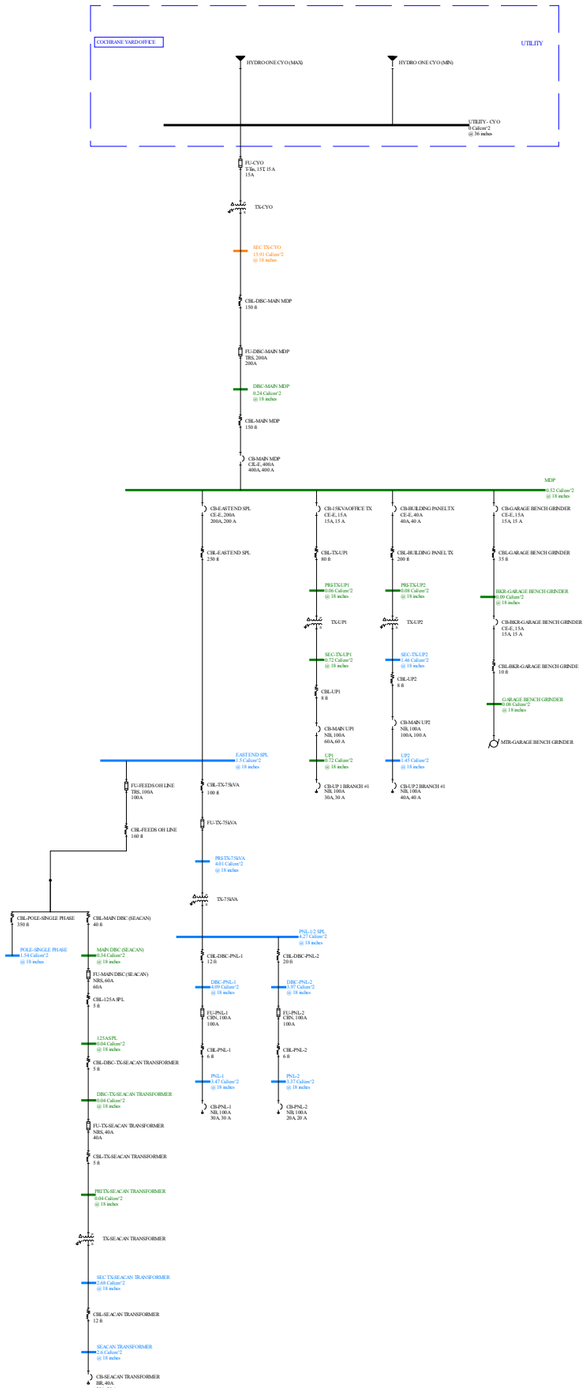

COCHRANE YARD/OFFICE
UTILITY
HYDRO ONE CYO (MAX)
HYDRO ONE CYO (MIN)
UTILITY - CYO
1 Cal/cm^2
@ 36 inches
FU-CYO
T3kA, 17T, 15 A
15A
TX-CYO
SEC TX-CYO
15.91 Cal/cm^2
@ 18 inches
CBL-DISC-MAIN MDP
150 ft
FU-DISC-MAIN MDP
TBD, 200A
200A
DISC-MAIN MDP
0.24 Cal/cm^2
@ 18 inches
CBL-MAIN MDP
150 ft
CB-MAIN MDP
CE-E, 400 A
400A, 400 A
MDP
5.32 Cal/cm^2
@ 18 inches
CB-EASTEND SPL
CE-E, 200A
200A, 200 A
CBL-EASTEND SPL
250 ft
CB-15KVAOFFICE TX
CE-E, 15A
15A, 15 A
CBL-TX-UP1
80 ft
PRI-TX-UP1
0.06 Cal/cm^2
@ 18 inches
TX-UP1
SEC-TX-UP1
0.72 Cal/cm^2
@ 18 inches
CBL-UP1
8 ft
CB-MAIN UP1
NB, 100A
60A, 60 A
UP1
0.24 Cal/cm^2
@ 18 inches
CB-UP 1 BRANCH #1
NB, 100A
30A, 30 A
CB-BUILDING PANEL TX
CE-E, 40A
40A, 40 A
CBL-BUILDING PANEL TX
200 ft
PRI-TX-UP2
0.08 Cal/cm^2
@ 18 inches
TX-UP2
SEC-TX-UP2
1.46 Cal/cm^2
@ 18 inches
CBL-UP2
8 ft
CB-MAIN UP2
NB, 100A
100A, 100 A
UP2
0.41 Cal/cm^2
@ 18 inches
CB-UP 2 BRANCH #1
NB, 100A
40A, 40 A
CB-GARAGE BENCH GRINDER
CE-E, 15A
15A, 15 A
CBL-GARAGE BENCH GRINDER
35 ft
BKR-GARAGE BENCH GRINDER
0.09 Cal/cm^2
@ 18 inches
CB-BKR-GARAGE BENCH GRINDER
CE-E, 15A
15A, 15 A
CBL-BKR-GARAGE BENCH GRINDE
10 ft
GARAGE BENCH GRINDER
0.09 Cal/cm^2
@ 18 inches
MTR-GARAGE BENCH GRINDER
EASTEND SPL
0.2 Cal/cm^2
@ 18 inches
FU-FEEDS OH LINE
TBD, 100A
100A
CBL-FEEDS OH LINE
160 ft
CBL-TX-75KVA
100 ft
FU-TX-75KVA
PRI-TX-75KVA
0.01 Cal/cm^2
@ 18 inches
TX-75KVA
CBL-POLE-SINGLE PHASE
350 ft
POLE-SINGLE PHASE
1.54 Cal/cm^2
@ 18 inches
CBL-MAIN DISC (SEACAN)
40 ft
MAIN DISC (SEACAN)
0.34 Cal/cm^2
@ 18 inches
FU-MAIN DISC (SEACAN)
NRS, 60A
60A
CBL-125A SPL
5 ft
125A SPL
2.04 Cal/cm^2
@ 18 inches
CBL-DISC-TX-SEACAN TRANSFORMER
5 ft
DISC-TX-SEACAN TRANSFORMER
2.04 Cal/cm^2
@ 18 inches
FU-TX-SEACAN TRANSFORMER
NRS, 40A
40A
CBL-TX-SEACAN TRANSFORMER
5 ft
PRI-TX-SEACAN TRANSFORMER
0.04 Cal/cm^2
@ 18 inches
TX-SEACAN TRANSFORMER
SEC-TX-SEACAN TRANSFORMER
2.04 Cal/cm^2
@ 18 inches
CBL-SEACAN TRANSFORMER
12 ft
SEACAN TRANSFORMER
2.4 Cal/cm^2
@ 18 inches
CB-SEACAN TRANSFORMER
3BL, 60A
30A, 30 A
PNL-1-2 SPL
2.77 Cal/cm^2
@ 18 inches
CBL-DISC-PNL-1
12 ft
CBL-DISC-PNL-2
20 ft
DISC-PNL-1
1.09 Cal/cm^2
@ 18 inches
DISC-PNL-2
1.97 Cal/cm^2
@ 18 inches
FU-PNL-1
CBN, 100A
100A
FU-PNL-2
CBN, 100A
100A
CBL-PNL-1
6 ft
CBL-PNL-2
6 ft
PNL-1
1.87 Cal/cm^2
@ 18 inches
PNL-2
1.37 Cal/cm^2
@ 18 inches
CB-PNL-1
NB, 100A
30A, 30 A
CB-PNL-2
NB, 100A
20A, 20 A

Table 5.4: Arc Flash As Rec

QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

Arc Flash Hazard Analysis
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Recommended Settings
2025-12-31

Bus Name	Protective Device Name	Bus kV	Device Bolted Fault (kA)	Device Arcing Fault (kA)	Trip/Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Equip Type	Electrode Config	Box Width (in)	Box Height (in)	Box Depth (in)	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level / Notes (*N)
125A SPL	FU-MAIN DISC (SEA-CAN)	0.600	2.560	2.02	0.010	0.000	PNL	VCB	12	14	10	25	2.20	18	0.042	(*S0)
AC CONDENSER #2	CB-AC CONDENSER #2	0.600	3.220	2.56	0.018	0.000	PNL	VCB	12	14	10	25	3.86	18	0.103	(*S0)
APU WAYSIDE	CB-APU WAYSIDE	0.480	20.390	15.61	0.050	0.000	PNL	VCB	12	14	10	25	23.49	18	1.836	(*S0)
A-SPL	FU-TX-A	0.208	3.450	1.25	2.000	0.000	PNL	VCB	12	14	10	25	45.30	18	5.244	(*N3) (*N9) (*N21a) (*N21c - S1 S0) (*S0)
BAGGAGE & COMMASIONRY	CB-BAGGAGE & COMMASIONRY	0.600	3.230	2.57	0.018	0.000	PNL	VCB	12	14	10	25	3.74	18	0.097	(*S0)
BASEMENT MUA DH 6	CB-BASEMENT MUA DH 6	0.600	4.090	3.28	0.018	0.000	PNL	VCB	12	14	10	25	4.61	18	0.136	(*S0)
BIG AIR COMPRESSOR	FU-BIG AIR COMPRESSOR	0.480	5.200	3.86	0.008	0.000	PNL	VCB	12	14	10	25	3.55	18	0.090	(*S0)
BKR-GARAGE BENCH GRINDER	CB-GARAGE BENCH GRINDER	0.600	2.860	2.26	0.018	0.000	PNL	VCB	12	14	10	25	3.46	18	0.086	(*S0)
BRK #12	FU-BRK #12	0.480	8.830	6.71	0.004	0.000	PNL	VCB	12	14	10	25	2.83	18	0.062	(*N4b) (*S0)
BUNKHOUSE WAYSIDE	CB-BUNKHOUSE WAYSIDE	0.480	24.230	18.31	0.050	0.000	PNL	VCB	12	14	10	25	26.15	18	2.180	(*S0)

QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

Arc Flash Hazard Analysis
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Recommended Settings
2025-12-31

Bus Name	Protective Device Name	Bus kV	Device Bolted Fault (kA)	Device Arcing Fault (kA)	Trip/Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Equip Type	Electrode Config	Box Width (in)	Box Height (in)	Box Depth (in)	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level / Notes (*N)
CC WAYSIDE POWER	FU-CC WAYSIDE POWER	0.208	2.460	0.86	2.000	0.000	PNL	VCB	12	14	10	25	35.60	18	3.568	(*N3) (*N9) (*S0)
CC WAYSIDE POWER (CB-MAIN CC WAYSIDE POWER LineSide)	FU-CC WAYSIDE POWER	0.208	2.460	0.86	2.000	0.000	PNL	VCB	12	14	10	25	35.60	18	3.568	(*N3) (*N9) (*S0)
COACH SHOP SWBD	CB-COACH SHOP SWBD	0.480	6.480	4.04	0.030	0.000	PNL	HCB	12	14	10	25	12.47	18	0.570	(*N3) (*N21c - S0) (*S1)
COACH SHOP SWBD (FU-MAIN COACH SHOP SWBD Line-Side)	CB-COACH SHOP SWBD	0.480	6.480	4.04	0.030	0.000	PNL	HCB	12	14	10	25	12.47	18	0.570	(*N3) (*S1)
COMPRESSOR	FU-COMPRESSOR	0.480	5.930	4.44	0.004	0.000	PNL	VCB	12	14	10	25	2.73	18	0.059	(*S0)
COMPRESSOR FUTURE	CB-COMPRESSOR FUTURE	0.480	7.860	5.95	0.015	0.000	PNL	VCB	12	14	10	25	6.19	18	0.218	(*S0)
COOKING MUA FAN #16	CB-COOKING MUA FAN #16	0.600	3.270	2.60	0.018	0.000	PNL	VCB	12	14	10	25	3.77	18	0.099	(*S0)

QUALUS SERVICES CANADA LTD.
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Arc Flash Hazard Analysis
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Recommended Settings
2025-12-31

Bus Name	Protective Device Name	Bus kV	Device Bolted Fault (kA)	Device Arcing Fault (kA)	Trip/Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Equip Type	Electrode Config	Box Width (in)	Box Height (in)	Box Depth (in)	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level / Notes (*N)
COOKING MUA FAN #17	CB-KITCHEN EXHOUST FAN #17	0.600	3.270	2.60	0.018	0.000	PNL	VCB	12	14	10	25	3.77	18	0.099	(*S0)
CTB SPL	FU-MAIN CTB SPL	0.208	5.400	2.34	2.000	0.000	PNL	VCB	12	14	10	25	69.38	18	10.364	(*N9) (*S0)
CTB SPL (FU-MAIN CTB SPL LineSide)	FU-CTB	0.208	5.400	2.34	2.000	0.000	PNL	VCB	12	14	10	25	69.38	18	10.364	(*N9) (*S0)
DH 10 DUCT HEATER	CB-DH 10 DUCT HEATER	0.600	3.230	2.57	0.018	0.000	PNL	VCB	12	14	10	25	3.73	18	0.097	(*S0)
DISC-BIG AIR COMPRESSOR	CB-DISC-BIG AIR COMPRESSOR	0.480	7.830	5.93	0.015	0.000	PNL	VCB	12	14	10	25	6.08	18	0.212	(*S0)
DISC-BRK #12	CB-DISC-BRK #12	0.480	9.050	6.89	0.014	0.000	PNL	VCB	12	14	10	25	6.14	18	0.215	(*S0)
DISC-COMPRESSOR	CB-DISC-COMPRESSOR 25HP	0.480	7.840	5.93	0.015	0.000	PNL	VCB	12	14	10	25	6.06	18	0.211	(*S0)
DISC-EF1	CB-DISC-EF1	0.208	0.730	0.23	1.316	0.000	PNL	VCB	12	14	10	25	11.76	18	0.608	(*N3) (*N15c) (*S1)
DISC-EF2	CB-DISC-EF2	0.208	0.820	0.26	1.076	0.000	PNL	VCB	12	14	10	25	11.26	18	0.567	(*N3) (*N15c) (*S1)

QUALUS SERVICES CANADA LTD.
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Arc Flash Hazard Analysis
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Recommended Settings
2025-12-31

Bus Name	Protective Device Name	Bus kV	Device Bolted Fault (kA)	Device Arcing Fault (kA)	Trip/Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Equip Type	Electrode Config	Box Width (in)	Box Height (in)	Box Depth (in)	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level / Notes (*N)
DISC-EF3	CB-DISC-EF3	0.208	1.000	0.32	0.761	0.000	PNL	VCB	12	14	10	25	10.43	18	0.502	(*N3) (*N15c) (*S1)
DISC-GARAGE DOOR	CB-DISC-GARAGE DOOR	0.480	5.260	3.90	0.014	0.000	PNL	VCB	12	14	10	25	4.22	18	0.118	(*S0)
DISC-MAIN MDP	FU-DISC-MAIN MDP	0.600	5.780	4.15	0.027	0.000	PNL	VCB	12	14	10	25	6.61	18	0.242	(*N3) (*S1)
DISC-MAIN MDP (FU-DISC-MAIN MDP Line-Side)	FU-CYO	0.600	5.840	4.19	2.000	0.000	PNL	VCB	12	14	10	25	98.93	18	18.272	(*N3) (*N9) (*S0)
DISC-MAKEUP AIR	CB-DISC-MAKEUP AIR	0.208	2.280	0.91	0.015	0.000	PNL	VCB	12	14	10	25	1.89	18	0.033	(*S0)
DISC-OH CRANE	CB-DISC-OH CRANE	0.480	5.560	4.15	0.015	0.000	PNL	VCB	12	14	10	25	5.30	18	0.170	(*S0)
DISC-OH CRANE (FU-OH CRANE LineSide)	FU-OH CRANE	0.480	5.560	4.15	0.004	0.000	PNL	VCB	12	14	10	25	2.99	18	0.068	(*S0)
DISC-OIL PUMP #1/2	CB-DISC-OIL PUMP #1/2	0.480	3.750	2.73	0.017	0.000	PNL	VCB	12	14	10	25	3.96	18	0.107	(*S0)
DISC-PIT JACK	CB-DISC-PIT JACK	0.480	1.430	0.87	0.404	0.000	PNL	VCB	12	14	10	25	12.95	18	0.709	(*N3) (*S1)
DISC-PNL-1	CB-EAST END SPL	0.208	2.400	0.97	2.000	0.000	PNL	VCB	12	14	10	25	38.77	18	4.090	(*N9) (*S0)

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Arc Flash Hazard Analysis
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Recommended Settings
2025-12-31

Bus Name	Protective Device Name	Bus kV	Device Bolted Fault (kA)	Device Arcing Fault (kA)	Trip/Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Equip Type	Electrode Config	Box Width (in)	Box Height (in)	Box Depth (in)	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level / Notes (*N)
DISC-PNL-2	CB-EAST END SPL	0.208	2.340	0.94	2.000	0.000	PNL	VCB	12	14	10	25	38.08	18	3.974	(*N9) (*S0)
DISC-TX-SEACAN TRANSFORMER	FU-MAIN DISC (SEACAN)	0.600	2.480	1.73	0.011	0.000	PNL	VCB	12	14	10	25	2.17	18	0.041	(*N3) (*S1)
DISC-VENT FAN REPAIR SHOP	CB-DISC-VENT FAN REPAIR SHOP	0.480	1.430	0.87	0.404	0.000	PNL	VCB	12	14	10	25	12.95	18	0.709	(*N3) (*S1)
DM EAST END	CB-DM EAST END	0.480	0.980	0.59	1.144	0.000	PNL	VCB	12	14	10	25	19.21	18	1.331	(*N3) (*S1)
DM WEST END	CB-DM WEST END	0.480	2.110	1.49	0.022	0.000	PNL	VCB	12	14	10	25	2.97	18	0.067	(*S0)
DRILL PRESS	FU-DISC-DRILL PRESS	0.480	1.750	1.23	0.010	0.000	PNL	VCB	12	14	10	25	1.60	18	0.025	(*S0)
DUCT HEATER #1	FU-LP B	0.600	2.620	1.83	0.012	0.000	PNL	VCB	12	14	10	25	2.38	18	0.047	(*N3) (*N5) (*S1)
DUCT HEATER #2	FU-LP B	0.600	2.620	1.83	0.012	0.000	PNL	VCB	12	14	10	25	2.38	18	0.047	(*N3) (*N5) (*S1)
EAST DOOR	CB-EAST DOOR	0.208	0.530	0.19	1.790	0.000	PNL	VCB	12	14	10	25	12.47	18	0.668	(*N15c) (*S1)
EAST END SPL	FU-DISC-MAIN MDP	0.600	3.670	2.59	0.274	0.000	PNL	VCB	12	14	10	25	20.71	18	1.501	(*N3) (*N5) (*S1)
EF1	CB-DISC-EF1	0.208	0.660	0.21	1.576	0.000	PNL	VCB	12	14	10	25	12.24	18	0.648	(*N3) (*N15c) (*S1)

QUALUS SERVICES CANADA LTD.
Formerly Enkompass Power and Energy Corp.

Arc Flash Hazard Analysis
Ontario Northland Cochrane Site
ENK-25-16394
Scenario: Recommended Settings
2025-12-31

Bus Name	Protective Device Name	Bus kV	Device Bolted Fault (kA)	Device Arcing Fault (kA)	Trip/Delay Time (sec.)	Breaker Opening Time/Tol (sec.)	Equip Type	Electrode Config	Box Width (in)	Box Height (in)	Box Depth (in)	Gap (mm)	Arc Flash Boundary (in)	Working Distance (in)	Incident Energy (cal/cm2)	PPE Level / Notes (*N)
EF2	CB-DISC-EF2	0.208	0.730	0.23	1.316	0.000	PNL	VCB	12	14	10	25	11.76	18	0.608	(*N3) (*N15c) (*S1)
EF3	CB-DISC-EF3	0.208	0.870	0.28	0.973	0.000	PNL	VCB	12	14	10	25	11.02	18	0.548	(*N3) (*N15c) (*S1)
ELEVATOR	CB-LPI (COMMON AREA)	0.600	5.740	4.67	0.015	0.000	PNL	VCB	12	14	10	25	4.97	18	0.154	(*N5) (*S0)
FC2 FAN-COIL	CB-FC2 FAN-COIL	0.600	3.230	2.57	0.018	0.000	PNL	VCB	12	14	10	25	3.74	18	0.097	(*S0)
FUEL HOUSE SPL	FU-FUEL HOUSE	0.480	7.470	4.96	0.089	0.000	PNL	VCB	12	14	10	25	16.35	18	1.029	(*N3) (*S0)
FUEL HOUSE SPL (FU-FUEL HOUSE LineSide)	FU-T-1	0.480	7.470	4.96	0.183	0.000	PNL	VCB	12	14	10	25	25.25	18	2.061	(*N3) (*S0)
GARAGE BENCH GRINDER	CB-BKR-GARAGE BENCH GRINDER	0.600	2.520	1.98	0.019	0.000	PNL	VCB	12	14	10	25	3.23	18	0.077	(*S0)
GARAGE DOOR	FU-GARAGE DOOR	0.480	3.500	2.54	0.004	0.000	PNL	VCB	12	14	10	25	1.49	18	0.022	(*N4b) (*S0)
HOT WATER TANK #1	CB-LPI (COMMON AREA)	0.600	6.280	5.12	0.015	0.000	PNL	VCB	12	14	10	25	5.19	18	0.164	(*N5) (*S0)

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HOT WATER TANK #2	CB-LPI (COMMON AREA)	0.600	6.280	5.12	0.015	0.000	PNL	VCB	12	14	10	25	5.19	18	0.164	(*N5) (*S0)
HR	CB-HR	0.208	2.600	1.06	0.015	0.000	PNL	VCB	12	14	10	25	2.17	18	0.041	(*S0)
JIB CRANE	FU-JIB CRANE	0.480	1.670	1.17	0.004	0.000	PNL	VCB	12	14	10	25	0.89	18	0.010	(*N4b) (*S0)
JIB CRANE (FU-MAIN JIB CRANE LineSide)	FU-JIB CRANE	0.480	1.670	1.17	0.004	0.000	PNL	VCB	12	14	10	25	0.89	18	0.010	(*N4b) (*S0)
LAUNDRY ROOM & HEATER	CB-LAUNDRY ROOM & HEATER	0.600	4.110	3.30	0.010	0.000	PNL	VCB	12	14	10	25	3.04	18	0.070	(*S0)
LIFT DEVICE	FU-LIFT DEVICE	0.480	0.890	0.60	0.008	0.000	PNL	VCB	12	14	10	25	0.89	18	0.010	(*N4b) (*S0)
LOCO BATTERY CHARGER	FU-LOCO BATTERY CHARGER	0.480	2.620	1.87	0.004	0.000	PNL	VCB	12	14	10	25	1.22	18	0.016	(*N4b) (*S0)
LP A	CB-MAIN LP A	0.208	4.190	1.53	0.043	0.000	PNL	VCB	12	14	10	25	4.79	18	0.144	(*N3) (*S1)
LP A (CB-MAIN LP A LineSide)	FU-LP A	0.208	4.190	1.53	0.442	0.000	PNL	VCB	12	14	10	25	20.49	18	1.476	(*N3) (*S1)
LP A/K/J SPL	FU-TX-HOTEL TRANSFORMER	0.208	6.690	2.55	0.169	0.000	PNL	VCB	12	14	10	25	15.72	18	0.967	(*N3) (*S1)
LP B	FU-LP B	0.600	5.100	3.65	0.008	0.000	PNL	VCB	12	14	10	25	2.92	18	0.066	(*N3) (*N4b) (*S0)

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LP B (CB-MAIN LP B LineSide)	FU-LP B	0.600	5.100	3.65	0.008	0.000	PNL	VCB	12	14	10	25	2.92	18	0.066	(*N3) (*N4b) (*S0)
LP C	FU-LP C	0.208	2.020	0.69	0.075	0.000	PNL	VCB	12	14	10	25	4.02	18	0.109	(*N3) (*S1)
LP C (CB-LP C LineSide)	FU-LP C	0.208	2.020	0.69	0.075	0.000	PNL	VCB	12	14	10	25	4.02	18	0.109	(*N3) (*S1)
LP D	FU-TX-ONR TRANS-FORMER	0.208	2.960	1.05	0.040	0.000	PNL	VCB	12	14	10	25	3.57	18	0.091	(*N3) (*N5) (*S1)
LP D (CB-LP D LineSide)	FU-TX-ONR TRANS-FORMER	0.208	2.960	1.05	0.040	0.000	PNL	VCB	12	14	10	25	3.57	18	0.091	(*N3) (*N5) (*S1)
LP E	FU-LP E	0.600	6.430	5.25	0.008	0.000	PNL	VCB	12	14	10	25	4.25	18	0.120	(*S0)
LP F	CB-LP F	0.208	3.800	1.59	0.025	0.000	PNL	VCB	12	14	10	25	3.43	18	0.085	(*S0)
LP F (CB-LP F LineSide)	CB-TX-LP-F/G	0.208	3.800	1.59	2.000	0.000	PNL	VCB	12	14	10	25	53.64	18	6.871	(*N9) (*S0)
LP G	CB-LP G	0.208	3.850	1.62	2.000	0.000	PNL	VCB	12	14	10	25	54.14	18	6.972	(*N9) (*S0)
LP G (CB-LP G LineSide)	CB-TX-LP-F/G	0.208	3.850	1.62	2.000	0.000	PNL	VCB	12	14	10	25	54.14	18	6.972	(*N9) (*S0)
LP H (RESTAU-RANT AREA)	CB-MAIN LP H (RESTAU-RANT AREA)	0.600	6.520	5.33	0.016	0.000	PNL	VCB	12	14	10	25	5.65	18	0.188	(*S0)
LP H (RESTAU-RANT AREA) (CB-MAIN LP H (RESTAU-	CB-LP H (RESTAU-RANT AREA)	0.600	6.520	5.33	0.016	0.000	PNL	VCB	12	14	10	25	5.65	18	0.188	(*S0)

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RANT AREA) Line-Side)																
LP J	FU-LP J	0.208	0.910	0.34	2.000	0.000	PNL	VCB	12	14	10	25	19.52	18	1.365	(*N9) (*N15c) (*S0)
LP J (CB-MAIN LP J LineSide)	FU-LP J	0.208	0.910	0.34	2.000	0.000	PNL	VCB	12	14	10	25	19.52	18	1.365	(*N9) (*N15c) (*S0)
LP K	FU-LP K	0.208	5.840	2.20	0.016	0.000	PNL	VCB	12	14	10	25	3.22	18	0.077	(*N3) (*S1)
LP K (CB-MAIN LP K LineSide)	FU-LP K	0.208	5.840	2.20	0.016	0.000	PNL	VCB	12	14	10	25	3.22	18	0.077	(*N3) (*S1)
LP PANEL A	FU-LP PANEL A	0.208	2.910	1.03	1.121	0.000	PNL	VCB	12	14	10	25	28.33	18	2.477	(*N3) (*S1)
LP PANEL A (CB-MAIN LP PANEL A LineSide)	FU-LP PANEL A	0.208	2.910	1.03	1.121	0.000	PNL	VCB	12	14	10	25	28.33	18	2.477	(*N3) (*S1)
LP-B	FU-LP-B	0.240	2.410	0.94	1.607	0.000	PNL	VCB	12	14	10	25	33.27	18	3.202	(*N3) (*S1)
LP-C/D SPL	FU-TX-ONR TRANS-FORMER	0.208	3.020	1.07	0.038	0.000	PNL	VCB	12	14	10	25	3.49	18	0.087	(*N3) (*S1)
LP-F/G SPL	CB-TX-LP-F/G	0.208	4.110	1.74	2.000	0.000	PNL	VCB	12	14	10	25	56.74	18	7.516	(*N9) (*S0)
LPI (COMMON AREA)	CB-LPI (COMMON AREA)	0.600	7.360	6.04	0.014	0.000	PNL	VCB	12	14	10	25	5.59	18	0.185	(*S0)

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MACHINE SHOP SPL	CB-MACHINE SHOP SPL	0.480	3.250	2.36	0.018	0.000	PNL	VCB	12	14	10	25	3.54	18	0.089	(*S0)
MAIN BKR CSI	CB-MAIN CSI	0.600	7.220	5.24	0.063	0.000	PNL	VCB	12	14	10	25	13.51	18	0.758	(*N3) (*S1)
MAIN BKR CSI (CB-MAIN CSI LineSide)	FU-CSI	0.600	7.330	6.02	2.000	0.000	PNL	VCB	12	14	10	25	124.75	18	26.469	(*N9) (*N21a) (*N21c - S1 S0) (*S0)
MAIN DISC (SEACAN)	FU-FEEDS OH LINE	0.600	2.570	1.78	0.091	0.000	PNL	VCB	12	14	10	25	8.13	18	0.337	(*N3) (*S1)
MAIN PANEL CF	FU-MAIN PANEL CF	0.208	5.020	1.86	1.064	0.000	PNL	VCB	12	14	10	25	40.56	18	4.396	(*N3) (*S1)
MAIN PANEL CF (FU-MAIN PANEL CF LineSide)	FU-CF	0.208	5.030	2.17	2.000	0.000	PNL	VCB	12	14	10	25	66.00	18	9.569	(*N9) (*S0)
MAIN SHOP PNL	CB-MAIN SHOP PNL	0.240	3.010	1.39	2.000	0.000	PNL	VCB	12	14	10	25	48.93	18	5.931	(*N9) (*S0)
MAIN SHOP PNL (CB-MAIN SHOP PNL LineSide)	FU-MAIN SHOP PNL	0.240	3.010	1.39	2.000	0.000	PNL	VCB	12	14	10	25	48.93	18	5.931	(*N9) (*S0)
MAKEUP AIR	CB-DISC-MAKEUP AIR	0.208	1.810	0.61	0.837	0.000	PNL	VCB	12	14	10	25	16.78	18	1.073	(*N3) (*N15c) (*S1)

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MCC MAIN SHOPS	CB-MAIN MCC MAIN SHOPS	0.480	9.490	6.38	0.113	0.000	MCC	VCB	12	14	10	25	22.97	18	1.772	(*N3) (*S0)
MCC MAIN SHOPS (CB-MAIN MCC MAIN SHOPS LineSide)	CB-MCC MAIN SHOPS	0.480	9.490	7.27	0.120	0.000	MCC	VCB	12	14	10	25	25.65	18	2.114	(*S0)
MDP	FU-DISC-MAIN MDP	0.600	4.780	3.41	0.071	0.000	PNL	VCB	12	14	10	25	10.72	18	0.524	(*N3) (*N5) (*S1)
MDP (CB-MAIN MDP LineSide)	FU-DISC-MAIN MDP	0.600	4.780	3.41	0.071	0.000	PNL	VCB	12	14	10	25	10.72	18	0.524	(*N3) (*S1)
MOTEL AREA SPL	CB-MOTEL AREA	0.600	7.360	6.04	0.014	0.000	PNL	VCB	12	14	10	25	5.59	18	0.185	(*S0)
MOTOR #2	FU-MOTOR #2	0.480	0.790	0.53	0.008	0.000	PNL	VCB	12	14	10	25	0.83	18	0.009	(*N4b) (*S0)
NEW PANEL FEED	FU-LP A	0.208	3.720	1.34	1.017	0.000	PNL	VCB	12	14	10	25	31.67	18	2.960	(*N3) (*N5) (*S1)
O/H DOOR E WALL	FU-O/H DOOR E WALL	0.480	0.800	0.54	0.008	0.000	PNL	VCB	12	14	10	25	1.18	18	0.015	(*S0)
O/H DOOR N WALL	FU-O/H DOOR N WALL	0.480	1.560	1.09	0.004	0.000	PNL	VCB	12	14	10	25	1.21	18	0.016	(*S0)
O/H DOOR W WALL	FU-O/H DOOR W WALL	0.480	2.850	2.05	0.004	0.000	PNL	VCB	12	14	10	25	1.58	18	0.025	(*S0)

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OH CRANE	FU-OH CRANE	0.480	2.880	2.08	0.008	0.000	PNL	VCB	12	14	10	25	2.96	18	0.067	(*S0)
OIL PUMP #1/2	CB-DISC-OIL PUMP #1/2	0.480	3.250	2.35	0.018	0.000	PNL	VCB	12	14	10	25	3.66	18	0.094	(*S0)
OL PUMP NORTH	FU-SS-OF-FLOAD PUMP-L	0.480	5.250	3.90	0.004	0.000	PNL	VCB	12	14	10	25	1.97	18	0.035	(*N4b) (*S1)
OL PUMP SOUTH	FU-SS-OF-FLOAD PUMP-L	0.480	5.050	3.75	0.004	0.000	PNL	VCB	12	14	10	25	2.53	18	0.052	(*S0)
ONR AREA SPL	CB-ONR AREA	0.600	7.230	5.94	0.015	0.000	PNL	VCB	12	14	10	25	6.14	18	0.215	(*S0)
OUTSIDE RIP PIT HEATERS	CB-OUT-SIDE RIP PIT HEATERS	0.480	1.210	0.73	0.675	0.000	PNL	VCB	12	14	10	25	15.94	18	0.988	(*N3) (*S1)
PANEL A	FU-PANEL A	0.208	5.180	1.93	0.144	0.000	PNL	VCB	12	14	10	25	11.89	18	0.618	(*N3) (*S1)
PANEL A (CS)	FU-PANEL A (CS)	0.208	2.900	1.19	2.000	0.000	PNL	VCB	12	14	10	25	44.32	18	5.065	(*N9) (*S1)
PANEL A (FU-PANEL A LineSide)	FU-MAIN CTB SPL	0.208	5.200	2.25	2.000	0.000	PNL	VCB	12	14	10	25	67.55	18	9.931	(*N9) (*S0)
PANEL B	FU-PANEL B	0.208	5.180	1.93	1.050	0.000	PNL	VCB	12	14	10	25	41.16	18	4.499	(*N3) (*S1)
PANEL B (CS)	FU-PANEL B (CS)	0.208	2.450	0.85	0.505	0.000	PNL	VCB	12	14	10	25	15.19	18	0.915	(*N3) (*S1)
PANEL B (FU-PANEL B LineSide)	FU-MAIN CTB SPL	0.208	5.200	2.25	2.000	0.000	PNL	VCB	12	14	10	25	67.55	18	9.931	(*N9) (*S0)

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PANEL B (PH)	CB-PANEL B (PH)	0.480	11.540	8.86	0.015	0.000	PNL	VCB	12	14	10	25	7.61	18	0.303	(*S0)
PANEL C (CS)	FU-PANEL C (CS)	0.208	3.280	1.17	0.962	0.000	PNL	VCB	12	14	10	25	28.03	18	2.436	(*N3) (*S1)
PANEL FH	FU-TX-PANEL FH	0.208	2.180	0.87	2.000	0.000	PNL	VCB	12	14	10	25	36.05	18	3.641	(*N5) (*N9) (*S0)
PANEL FH (CB-PANEL FH Line-Side)	FU-TX-PANEL FH	0.208	2.180	0.87	2.000	0.000	PNL	VCB	12	14	10	25	36.05	18	3.641	(*N9) (*S0)
PANEL J	CB-TX-PANEL J	0.208	1.430	0.55	2.000	0.000	PNL	VCB	12	14	10	25	26.80	18	2.266	(*N9) (*N15c) (*S0)
PANEL LPY	CB-TX-Y	0.208	1.830	0.72	2.000	0.000	PNL	VCB	12	14	10	25	31.66	18	2.958	(*N9) (*N15c) (*S0)
PIT JACK	FU-PIT JACK	0.480	1.370	0.95	0.008	0.000	PNL	VCB	12	14	10	25	1.42	18	0.021	(*S0)
PNL-1	FU-PNL-1	0.208	2.360	0.82	2.000	0.000	PNL	VCB	12	14	10	25	34.99	18	3.471	(*N3) (*N9) (*S0)
PNL-1/2 SPL	CB-EAST END SPL	0.208	2.490	1.01	2.000	0.000	PNL	VCB	12	14	10	25	39.82	18	4.268	(*N9) (*S0)
PNL-2	FU-PNL-2	0.208	2.300	0.79	2.000	0.000	PNL	VCB	12	14	10	25	34.36	18	3.372	(*N3) (*N9) (*S0)
POLE-SINGLE PHASE	FU-FEEDS OH LINE	0.600	1.690	1.16	0.656	0.000	PNL	VCB	12	14	10	25	21.02	18	1.538	(*N3) (*S1)
POWER-HOUSE SWBD	FU-TX-T2	0.480	10.790	6.86	0.160	0.000	PNL	HCB	12	14	10	25	39.25	18	5.840	(*N3) (*N5) (*S0)

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POWER-HOUSE SWBD (CB-POWER-HOUSE SWBD Line-Side)	FU-TX-T2	0.480	10.790	6.86	0.160	0.000	PNL	HCB	12	14	10	25	39.25	18	5.840	(*N3) (*S0)
PP (C-H)	CB-PP (C-H)	0.208	3.480	1.25	0.492	0.000	PNL	VCB	12	14	10	25	19.22	18	1.333	(*N3) (*S1)
PRI TX-75kVA (LP A/ CC WP)	FU-TX-75kVA (LP A/ CC WP)	0.480	6.630	4.98	0.008	0.000	PNL	VCB	12	14	10	25	3.59	18	0.091	(*N4b) (*S0)
PRI TX-75kVA (LP A/ CC WP) (FU-TX-75kVA (LP A/ CC WP) Line-Side)	CB-TX-75kVA (LP A/ CC WP)	0.480	6.630	4.98	0.016	0.000	PNL	VCB	12	14	10	25	5.32	18	0.171	(*S0)
PRI TX-A	FU-TX-A	0.480	6.800	5.12	0.010	0.000	PNL	VCB	12	14	10	25	4.44	18	0.128	(*N21a) (*N21c - S1 S0) (*S0)
PRI TX-HO-TEL TRANS-FORMER	FU-TX-HO-TEL TRANS-FORMER	0.600	7.250	5.95	0.004	0.000	PNL	VCB	12	14	10	25	2.60	18	0.054	(*N4b) (*S0)
PRI TX-ONR TRANS-FORMER	FU-TX-ONR TRANS-FORMER	0.600	4.720	3.81	0.004	0.000	PNL	VCB	12	14	10	25	1.93	18	0.034	(*N4b) (*S0)

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PRI TX-PANEL FH	FU-TX-PANEL FH	0.480	7.560	5.71	0.004	0.000	PNL	VCB	12	14	10	25	2.54	18	0.053	(*N4b) (*S0)
PRI TX-SEACAN TRANSFORMER	FU-TX-SEACAN TRANSFORMER	0.600	2.440	1.92	0.010	0.000	PNL	VCB	12	14	10	25	2.13	18	0.040	(*S0)
PRI TX-T-3 SPL	CB-TRANSFORMER XFER SWITCH	0.480	12.360	9.50	0.015	0.000	PNL	VCB	12	14	10	25	7.88	18	0.320	(*S0)
PRI TX-Y	CB-TX-Y	0.480	2.400	1.71	0.021	0.000	PNL	VCB	12	14	10	25	3.20	18	0.076	(*S0)
PRI-TX-75kVA	FU-DISC-MAIN MDP	0.600	2.870	2.00	0.959	0.000	PNL	VCB	12	14	10	25	38.31	18	4.012	(*N3) (*N5) (*S1)
PRI-TX-LP-F/G	CB-LP H (RESTAURANT AREA)	0.600	5.960	4.85	0.017	0.000	PNL	VCB	12	14	10	25	5.48	18	0.179	(*N5) (*S0)
PRI-TX-PANEL J	CB-TX-PANEL J	0.600	4.800	3.88	0.016	0.000	PNL	VCB	12	14	10	25	4.58	18	0.135	(*S0)
PRI-TX-UP1	CB-15KVA OFFICE TX	0.600	1.750	1.35	0.021	0.000	PNL	VCB	12	14	10	25	2.72	18	0.059	(*S0)
PRI-TX-UP2	CB-BUILDING PANEL TX	0.600	1.620	1.11	0.034	0.000	PNL	VCB	12	14	10	25	3.21	18	0.077	(*N3) (*S1)
RF PUMP NORTH	FU-SS-REFUEL PUMP-L	0.480	5.250	3.90	0.004	0.000	PNL	VCB	12	14	10	25	1.97	18	0.035	(*N4b) (*S1)
RF PUMP SOUTH	FU-SS-REFUEL PUMP-L	0.480	5.040	3.74	0.004	0.000	PNL	VCB	12	14	10	25	2.63	18	0.056	(*S0)

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RHU SPL	CB-RHU SPL	0.480	5.330	3.97	0.016	0.000	PNL	VCB	12	14	10	25	5.35	18	0.173	(*S0)
RIP PLUG	CB-RIP PLUG	0.480	6.400	4.80	0.015	0.000	PNL	VCB	12	14	10	25	5.05	18	0.157	(*S0)
ROLLUP DOOR	CB-ROLLUP DOOR	0.208	0.530	0.19	1.790	0.000	PNL	VCB	12	14	10	25	12.47	18	0.668	(*N15c) (*S1)
SEACAN TRANSFORMER	FU-TX-SEACAN TRANSFORMER	0.208	1.830	0.62	2.000	0.000	PNL	VCB	12	14	10	25	29.18	18	2.597	(*N3) (*N9) (*N15c) (*S0)
SEC TX-75kVA (LP A/ CC WP)	FU-TX-75kVA (LP A/ CC WP)	0.208	3.780	1.59	2.000	0.000	PNL	VCB	12	14	10	25	52.47	18	6.633	(*N9) (*S0)
SEC TX-A	FU-TX-A	0.208	3.480	1.26	2.000	0.000	PNL	VCB	12	14	10	25	45.60	18	5.300	(*N3) (*N9) (*N21a) (*N21c - S1 S0) (*S0)
SEC TX-CF	FU-CF	0.208	10.940	5.03	2.000	0.000	PNL	VCB	12	14	10	25	114.91	18	23.213	(*N9) (*S0)
SEC TX-CTB	FU-CTB	0.208	7.750	3.47	2.000	0.000	PNL	VCB	12	14	10	25	89.96	18	15.696	(*N9) (*S0)
SEC TX-CYO	FU-CYO	0.600	7.150	5.17	1.394	0.000	PNL	VCB	12	14	10	25	90.72	18	15.910	(*N3) (*S1)
SEC TX-HOTEL TRANSFORMER	FU-TX-HOTEL TRANSFORMER	0.208	6.770	2.58	0.161	0.000	PNL	VCB	12	14	10	25	15.38	18	0.933	(*N3) (*S1)
SEC TX-ONR TRANSFORMER	FU-TX-ONR TRANSFORMER	0.208	3.090	1.10	0.035	0.000	PNL	VCB	12	14	10	25	3.38	18	0.083	(*N3) (*S1)
SEC TX-PANEL FH	FU-TX-PANEL FH	0.208	2.210	0.88	2.000	0.000	PNL	VCB	12	14	10	25	36.45	18	3.706	(*N9) (*S0)

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SEC TX-SEACAN TRANSFORMER	FU-TX-SEACAN TRANSFORMER	0.208	1.880	0.64	2.000	0.000	PNL	VCB	12	14	10	25	29.76	18	2.680	(*N3) (*N9) (*N15c) (*S0)
SEC TX-T-3 SPL	CB-TRANSFORMER XFER SWITCH	0.240	2.810	1.29	2.000	0.000	PNL	VCB	12	14	10	25	45.76	18	5.330	(*N9) (*S0)
SEC TX-Y	CB-TX-Y	0.208	2.110	0.84	2.000	0.000	PNL	VCB	12	14	10	25	34.97	18	3.469	(*N9) (*S0)
SECOND LATHE	FU-SECOND LATHE	0.480	3.320	2.41	0.004	0.000	PNL	VCB	12	14	10	25	1.44	18	0.021	(*N4b) (*S0)
SEC-TX-LP-F/G	CB-TX-LP-F/G	0.208	4.340	1.84	2.000	0.000	PNL	VCB	12	14	10	25	58.98	18	7.996	(*N9) (*S0)
SEC-TX-PANEL J	CB-TX-PANEL J	0.208	1.500	0.58	2.000	0.000	PNL	VCB	12	14	10	25	27.69	18	2.388	(*N9) (*N15c) (*S0)
SEC-TX-UP1	CB-15KVA OFFICE TX	0.208	0.520	0.19	2.000	0.000	PNL	VCB	12	14	10	25	13.12	18	0.724	(*N9) (*N15c) (*S0)
SEC-TX-UP2	CB-BUILDING PANEL TX	0.208	0.970	0.36	2.000	0.000	PNL	VCB	12	14	10	25	20.37	18	1.462	(*N9) (*N15c) (*S0)
SMALL AIR COMP.	CB-COMPRESSOR 10HP	0.480	3.410	2.48	0.018	0.000	PNL	VCB	12	14	10	25	3.78	18	0.099	(*S0)
SOUTH DOOR	CB-SOUTH DOOR	0.208	0.530	0.19	1.790	0.000	PNL	VCB	12	14	10	25	12.47	18	0.668	(*N15c) (*S1)
SPL LP A/ CC WP	FU-SPL LP A/ CC WP	0.208	3.700	1.55	2.000	0.000	PNL	VCB	12	14	10	25	51.71	18	6.479	(*N9) (*S0)

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SPL LP A/ CC WP (FU-SPL LP A/ CC WP Line-Side)	FU-TX-75kVA (LP A/ CC WP)	0.208	3.700	1.55	2.000	0.000	PNL	VCB	12	14	10	25	51.71	18	6.479	(*N9) (*S0)
SPL PANEL BTW TRACKS #3&4	CB-SPL PANEL BTW TRACKS #3&4	0.480	6.610	4.97	0.015	0.000	PNL	VCB	12	14	10	25	5.17	18	0.163	(*S0)
SS-OF-FLOAD PUMP-E	FU-SS-OF-FLOAD PUMP-L	0.480	5.980	4.47	0.004	0.000	PNL	VCB	12	14	10	25	2.16	18	0.041	(*N4b) (*S1)
SS-OF-FLOAD PUMP-L	FU-SS-OF-FLOAD PUMP-L	0.480	6.210	4.65	0.004	0.000	PNL	VCB	12	14	10	25	2.79	18	0.061	(*S0)
SS-OF-FLOAD PUMP-N	FU-SS-OF-FLOAD PUMP-L	0.480	6.210	4.65	0.004	0.000	PNL	VCB	12	14	10	25	2.79	18	0.061	(*S0)
SS-REFUEL PUMP-E	FU-SS-REFUEL PUMP-L	0.480	5.980	4.47	0.004	0.000	PNL	VCB	12	14	10	25	2.16	18	0.041	(*N4b) (*S1)
SS-REFUEL PUMP-L	FU-SS-REFUEL PUMP-L	0.480	6.190	4.64	0.004	0.000	PNL	VCB	12	14	10	25	2.89	18	0.064	(*S0)
SS-REFUEL PUMP-N	FU-SS-REFUEL PUMP-L	0.480	6.190	4.64	0.004	0.000	PNL	VCB	12	14	10	25	2.89	18	0.064	(*S0)
SS-T-2-L	FU-TX-T2	0.480	12.040	8.13	0.115	0.000	PNL	VCB	12	14	10	25	28.28	18	2.470	(*N3) (*S0)
SS-T-2-N	FU-TX-T2	0.480	12.040	8.13	0.115	0.000	PNL	VCB	12	14	10	25	28.28	18	2.470	(*N3) (*S0)

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SUMP PUMP 1/2	CB-DISC-SUMP PUMP 1/2	0.208	1.000	0.32	0.761	0.000	PNL	VCB	12	14	10	25	10.43	18	0.502	(*N3) (*N15c) (*S1)
T-1 DIP POLE	FU-T-1	0.480	8.960	5.99	0.127	0.000	PNL	VCB	12	14	10	25	22.80	18	1.751	(*N3) (*S0)
T-3 SPL	CB-TS-3-N	0.240	3.940	1.86	2.000	0.000	PNL	VCB	12	14	10	25	59.25	18	8.054	(*N9) (*S0)
T-3 SPL (FU-LP-B Line-Side)	FU-LP-B	0.240	2.670	1.05	0.943	0.000	PNL	VCB	12	14	10	25	25.63	18	2.111	(*N3) (*S1)
THUNDER DOME PANEL	CB-THUNDER DOME PANEL	0.208	1.230	0.47	2.000	0.000	PNL	VCB	12	14	10	25	23.36	18	1.820	(*N9) (*N15c) (*S0)
THUNDER DOME PANEL (CB-THUNDER DOME PANEL Line-Side)	CB-DISC-THUNDER DOME PANEL	0.208	1.230	0.47	2.000	0.000	PNL	VCB	12	14	10	25	23.36	18	1.820	(*N9) (*N15c) (*S0)
TRACK #1 EE	FU-TRACK #1 EE	0.480	0.800	0.54	0.010	0.000	PNL	VCB	12	14	10	25	0.94	18	0.011	(*S0)
TRACK #2 EE	FU-TRACK #2 EE	0.480	0.800	0.54	0.010	0.000	PNL	VCB	12	14	10	25	0.94	18	0.011	(*S0)
TRACK #3 EE	FU-TRACK #3 EE	0.480	0.800	0.54	0.010	0.000	PNL	VCB	12	14	10	25	0.94	18	0.011	(*S0)
TRACK #3 WE	FU-TRACK #3 WE	0.480	1.490	1.04	0.010	0.000	PNL	VCB	12	14	10	25	1.43	18	0.021	(*S0)
TRACK #4 EE	FU-TRACK #4 EE	0.480	0.800	0.54	0.010	0.000	PNL	VCB	12	14	10	25	0.94	18	0.011	(*S0)

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TRACK #4 WE	FU-TRACK #4 WE	0.480	1.490	1.04	0.010	0.000	PNL	VCB	12	14	10	25	1.43	18	0.021	(*S0)
TRACK1 WAYSIDE	CB-TRACK1 WAYSIDE	0.480	25.930	19.46	0.165	0.000	PNL	VCB	12	14	10	25	57.35	18	7.646	(*S0)
TRACK2 WAYSIDE	CB-TRACK2 WAYSIDE	0.480	22.980	17.45	0.050	0.000	PNL	VCB	12	14	10	25	25.32	18	2.070	(*S0)
TRACK3 WAYSIDE	CB-TRACK3 WAYSIDE	0.480	20.960	16.02	0.050	0.000	PNL	VCB	12	14	10	25	23.90	18	1.888	(*S0)
TRACK4 WAYSIDE	CB-TRACK4 WAYSIDE	0.480	14.850	11.45	0.050	0.000	PNL	VCB	12	14	10	25	19.09	18	1.319	(*S0)
TS-3-N	CB-TS-3-N	0.240	4.010	1.90	2.000	0.000	PNL	VCB	12	14	10	25	60.02	18	8.221	(*N9) (*S0)
TS-3-N (CB-TS-3-N LineSide)	FU-TX-T3	0.240	4.010	1.90	2.000	0.000	PNL	VCB	12	14	10	25	60.02	18	8.221	(*N9) (*S0)
TS-T-3-E	CB-TRANSFORMER XFER SWITCH	0.240	2.760	1.27	2.000	0.000	PNL	VCB	12	14	10	25	45.29	18	5.242	(*N9) (*S0)
TS-T-3-L	CB-TS-3-N	0.240	4.010	1.90	2.000	0.000	PNL	VCB	12	14	10	25	60.02	18	8.221	(*N9) (*S0)
UP1	CB-15KVA OFFICE TX	0.208	0.510	0.18	2.000	0.000	PNL	VCB	12	14	10	25	13.03	18	0.716	(*N5) (*N9) (*N15c) (*S0)
UP1 (CB-MAIN UP1 LineSide)	CB-15KVA OFFICE TX	0.208	0.510	0.18	2.000	0.000	PNL	VCB	12	14	10	25	13.03	18	0.716	(*N9) (*N15c) (*S0)
UP2	CB-MAIN UP2	0.208	0.960	0.36	2.000	0.000	PNL	VCB	12	14	10	25	20.23	18	1.447	(*N9) (*N15c) (*S0)

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UP2 (CB-MAIN UP2 LineSide)	CB-BUILDING PANEL TX	0.208	0.960	0.36	2.000	0.000	PNL	VCB	12	14	10	25	20.23	18	1.447	(*N9) (*N15c) (*S0)
VENT FAN REPAIR SHOP	FU-VENT FAN REPAIR SHOP	0.480	0.980	0.59	0.013	0.000	PNL	VCB	12	14	10	25	1.46	18	0.022	(*S0)
VENT FANS SERVICE SHOP	CB-VENT FANS SERVICE SHOP	0.480	0.890	0.53	1.404	0.000	PNL	VCB	12	14	10	25	20.39	18	1.464	(*N3) (*S1)
VFSS #1	FU-VFSS #1	0.480	0.760	0.45	0.022	0.000	PNL	VCB	12	14	10	25	1.63	18	0.026	(*S0)
VFSS #2	FU-VFSS #2	0.480	0.760	0.45	0.022	0.000	PNL	VCB	12	14	10	25	1.63	18	0.026	(*S0)
VFSS #3	FU-VFSS #3	0.480	0.760	0.45	0.023	0.000	PNL	VCB	12	14	10	25	1.66	18	0.027	(*S0)
VFSS #4	FU-VFSS #4	0.480	0.760	0.51	0.010	0.000	PNL	VCB	12	14	10	25	1.24	18	0.017	(*S0)
WALKWAY DUCT HEATER #3	FU-LP B	0.600	2.620	1.83	0.012	0.000	PNL	VCB	12	14	10	25	2.38	18	0.047	(*N3) (*N5) (*S1)
WAYSIDE SWBD	FU-TX-WAYSIDE	0.480	25.660	16.13	0.442	0.000	PNL	HCB	12	14	10	25	94.99	18	35.129	(*N3) (*N21c - S0) (*S1)
WELD OUTLET R1	FU-WELD OUTLET R1	0.480	5.910	4.41	0.004	0.000	PNL	VCB	12	14	10	25	2.14	18	0.040	(*N4b) (*S0)
WELD OUTLET R2	FU-WELD OUTLET R2	0.480	4.750	3.51	0.004	0.000	PNL	VCB	12	14	10	25	1.84	18	0.031	(*N4b) (*S0)
WELD OUTLET R3	FU-WELD OUTLET R3	0.480	3.810	2.78	0.004	0.000	PNL	VCB	12	14	10	25	1.58	18	0.025	(*N4b) (*S0)
WELD OUTLET R4	FU-WELD OUTLET R4	0.480	3.160	2.28	0.008	0.000	PNL	VCB	12	14	10	25	2.14	18	0.040	(*N4b) (*S0)
WELD OUTLET R5	FU-WELD OUTLET R5	0.480	2.890	2.08	0.008	0.000	PNL	VCB	12	14	10	25	2.01	18	0.036	(*N4b) (*S0)

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WELD OUTLET R6	FU-WELD OUTLET R6	0.480	3.400	2.46	0.008	0.000	PNL	VCB	12	14	10	25	2.25	18	0.043	(*N4b) (*S1)
WELD OUTLET R7	FU-WELD OUTLET R7	0.480	4.580	3.38	0.004	0.000	PNL	VCB	12	14	10	25	1.80	18	0.030	(*N4b) (*S0)
WELDER PLUG #1	CB-WELDER PLUG #1	0.480	2.470	1.76	0.021	0.000	PNL	VCB	12	14	10	25	3.21	18	0.076	(*S0)
WELDER PLUG #1 (FU-WELDER PLUG #1 LineSide)	FU-WELDER PLUG #1	0.480	2.370	1.48	0.013	0.000	PNL	VCB	12	14	10	25	2.13	18	0.040	(*N3) (*S1)
WELDER PLUG #2	CB-WELDER PLUG #2	0.480	3.580	2.61	0.017	0.000	PNL	VCB	12	14	10	25	3.69	18	0.095	(*S0)
WELDER PLUG #2 (FU-WELDER PLUG #2 LineSide)	FU-WELDER PLUG #2	0.480	3.580	2.61	0.008	0.000	PNL	VCB	12	14	10	25	2.34	18	0.046	(*N4b) (*S0)
WEST DOOR	CB-WEST DOOR	0.208	0.530	0.19	1.790	0.000	PNL	VCB	12	14	10	25	12.47	18	0.668	(*N15c) (*S1)
WHITING JACKS ED PLUG	FU-MAIN WHITING JACKS ED PLUG	0.480	2.210	1.57	0.004	0.000	PNL	VCB	12	14	10	25	1.08	18	0.013	(*N4b) (*S0)

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WHITING JACKSED PLUG (FU-MAIN WHITING JACKS ED PLUG Line-Side)	FU-WHITING JACKSED PLUG	0.480	2.210	1.57	0.004	0.000	PNL	VCB	12	14	10	25	1.08	18	0.013	(*N4b) (*S0)
WHITING JACKS PLUG	FU-MAIN WHITING JACKS PLUG	0.480	1.560	1.09	0.004	0.000	PNL	VCB	12	14	10	25	0.85	18	0.009	(*N4b) (*S0)
WHITING JACKS PLUG (FU-MAIN WHITING JACKS PLUG LineSide)	FU-WHITING JACKS PLUG	0.480	1.560	1.09	0.004	0.000	PNL	VCB	12	14	10	25	0.85	18	0.009	(*N4b) (*S0)

LEGEND

< 40 cal/cm2
< 12 cal/cm2
< 1.2 cal/cm2

For additional information refer to NFPA 70 E, Standard for Electrical Safety in the Workplace.

#Equip Eval Failed = 4

#Bus Equip Eval Failed = 0

#Equip Failed in Scenarios = 6

(*N3) - Arcing Current Low Tolerances Used

(*N4b) - Current Limiting Fuse

(*N5) - Miscoordinated, Upstream Device Tripped

(*N9) - Max Arcing Duration Reached

(*N15c) - Sustainable arc in 240V or less and bolted fault current < 2000 A is less likely to occur (IEEE 1584-2018 Section 4.3)

(*N21a) - Equipment Evaluation Failed, OVERDUTIED PROTECTIVE DEVICE EQUIPMENT FOUND - Inappropriate to provide arc-flash hazard results.

(*N21c) - WARNING! Equipment Evaluation Failed in the indicated Scenario(s).

IEEE 1584 2018 Bus + Line Side - Comprehensive Fault99% Cleared Fault Threshold, mis-coordination checked

Worst Case:

(*S0) - S0: S0) UT MAX ATS N MTR ON

(*S1) - S1: S1) UT MIN ATS E MTR OFF

5.3 CSA Z462 Table F.2 - Estimated likelihood of occurrence of an arc flash incident

Table F.2

Table 5.5: Estimate the likelihood of occurrence of an arc flash incident for ac and dc systems

Task	Equipment condition*	Likelihood of occurrence
Reading a panel-mounted meter, whether analog, or digital, while operating the meter selector switch or controls. Performing infrared thermography and other non-contact inspections outside the restricted approach boundary. This activity does not include opening of doors or covers. Working on control circuits with exposed energized electrical conductors and circuit parts, nominal 125 V ac or dc, or below without any other exposed energized equipment over nominal 125 V ac or dc, including opening of hinged coveres to gain access. Examination of insulated cable with no manipulation of cable. For dc systems, maintenance on a single cell of a battery system or multi-cell units in an open rack.	Any	Improbable
For ac systems, work on energized electrical conductors and circuit parts, including electrical testing. Operation of a circuit breaker or switch the first time after installation or completion of work or maintenance in the equipment. For dc systems, working on energized electrical conductors and circuit parts of series-connected battery cells, including electrical testing. Removal or installation of circuit breakers or switches. Opening hinged door(s) or cover(s) or removal of bolted covers (to expose bare, energized electrical conductors and circuit parts). For dc systems, this includes bolted covers, such as battery terminal covers. Application of temporary protective grounding equipment, after voltage test. Working on control circuits with exposed energized electrical conductors and circuit parts, greater than 120 V. Insertion or removal of individual starter buckets from MCC. Insertion or removal (racking) of circuit breakers or starters from cubicles,	Any	Possible

Task	Equipment condition*	Likelihood of occurrence
doors open or closed. Insertion or removal of plug-in devices into or from busways. Examination of insulated cable with manipulation of cable. Working on exposed energized electrical conductors and circuit parts of equipment firectly supplied by a panelboard or MCC. Insertion or removal of revenue meters (kW-h, at primary voltage and current). Insertion or removal of connector covers or battery intercell connector(s). For dc systems, working on exposed energized electrical conductors and circuit parts of utilization equipment directly supplied by a dc source. Opening VT or control power transformer compartments. Operation of outdoor disconnect switch (hookstick operated) at 1 kV through 15 kV. Operation of outdoor disconnect switch (gang-operated, from grade) at 1 kV through 15 kV.		
Operation of a circuit breaker, switch, contactor, or starter. Voltage testing on individual battery cells or individual multi-cell units. Removal or installation of covers for equipment such as wireways, junction boxes, and cable trays that does not expose bare, energized electrical conductors, and circuit parts. Opening a panelboard hinged door or cover to access dead front overcur-rent devices.	Normal	Improbable
Removal of battery nonconductive intercell connector covers. Maintenance and testing on individual battery cells or individual multi-cell units in an open rack. Insertion or removal of individual cells or multi-cell units of a battery system in an open rack.	Abnormal	Possible

Task	Equipment condition*	Likelihood of occurrence
Arc-resistant equipment with the doors closed and secured, and where the available fault current and fault clearing time does not exceed that of the arc-resistant rating of the equipment: • insertion or removal of individual starter buckets; • insertion or removal (racking) of circuit breakers from cubicles; • insertion or removal (racking) of ground and test device; or • insertion or removal (racing) of VTs on or off the bus.		

Equipment is considered to be in a "normal condition" if all of the conditions in clause 4.1.7.8.4 are satisfied.

5.4 CSA Z462 Table 2 - PPE Requirements When Incident Exposure is Determined

Table 2
Selection of arc-rated clothing and other PPE when the incident energy analysis method or an arc flash PPE selection table method is used
(See Clauses 4.3.5.6.2, H.1, H.2, Q.4, and V.4, and Tables H.1, V.1, V.2, and V.3.)

Incident energy exposures equal to 1.2 cal/cm ² (5 J/cm ²) up to and including 12 cal/cm ² (50 J/cm ²)
Arc-rated clothing with an arc rating equal to or greater than the estimated incident energy *
• Arc-rated long-sleeve shirt and pants or arc-rated coverall or arc flash suit (SR)
• Arc-rated faceshield and arc-rated balaclava or arc flash suit hood (SR) †
• Arc-rated outerwear (e.g., jacket, parka, rainwear, hard hat liner, high-visibility apparel) (AN) ‡
Heavy-duty leather gloves, arc-rated gloves or rubber insulating gloves with protectors (SR) ϕ
Hard hat
Safety glasses or safety goggles (SR)
Hearing protection
Leather footwear**
Incident energy exposures greater than 12 cal/cm ² (50 J/cm ²)
Arc-rated clothing with an arc rating equal to or greater than the estimated incident energy *
• Arc-rated long-sleeve shirt and pants or arc-rated coverall or arc flash suit (SR)
• Arc-rated arc flash suit hood
• Arc-rated outerwear (e.g., jacket, parka, rainwear, hard hat liner, high-visibility apparel) (AN) ‡
Arc-rated gloves or rubber insulating gloves with protectors (SR) ϕ
Hard hat
Safety glasses or safety goggles (SR)
Hearing protection
Leather footwear**

Legend:
SR = selection of one in group is required
AN = as needed

Table 2 (Continued)

* *Arc ratings can be for a single layer, such as an arc-rated shirt and pants or a coverall, or for an arc flash suit or a multi-layer system if tested as a combination consisting of an arc-rated shirt and pants, coverall, and arc flash suit.*
† *Faceshields with a wrap-around guarding to protect the face, chin, forehead, ears, and neck area are required by Clause 4.3.7.3.10 c). Where the back of the head is inside the arc flash boundary, a balaclava or an arc flash hood shall be required for full head and neck protection.*
‡ *The arc rating of outerwear worn over arc-rated clothing that are not used as part of a layered system shall not be required to be equal to or greater than the estimated incident energy exposure.*
ϕ *Rubber insulating gloves with protectores provide arc flash protection in addition to shock protection. Higher class rubber insulating gloves with protectors, due to their increased material thickness, provide increased arc flash protection.*

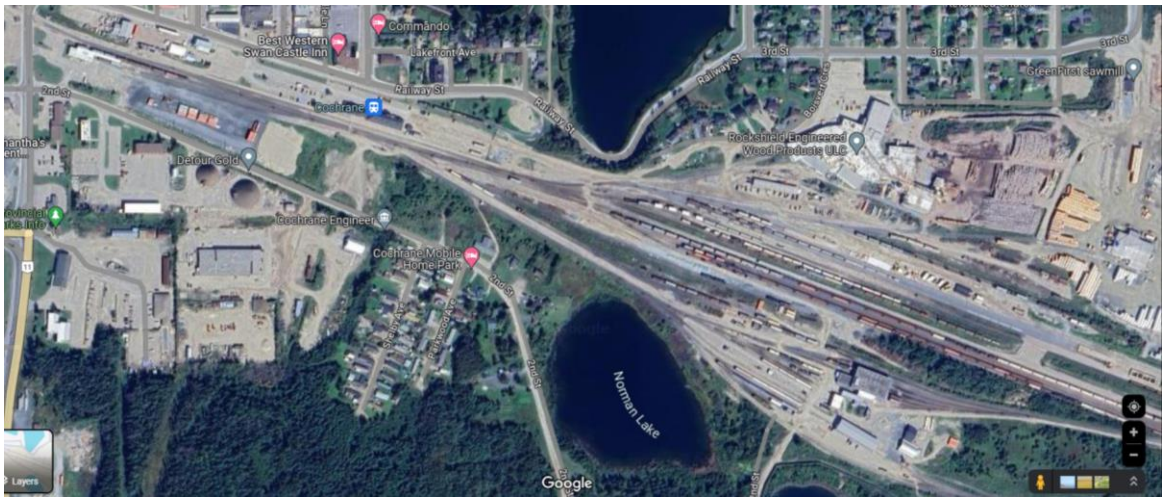
*** Footwear other than leather or dielectric may be used, provided it has been tested for and demonstrates no ignition, melting, or drip at or greater than the estimated incident energy exposure.*

6 Appendix

6.1 Utility

Ontario Northland Buildings – Fault Level Report

Northern Ontario Wires Distribution System – Cochrane Ontario



Prepared by: Brian Smith C.E.T. - Consultant

Date: January 19, 2024

Background:

Northern Ontario Wires received a request by Ontario Northland to provide Utility Fault Level information for the purposes of an Arc Flash study pertaining to service at the following sites of interest:

Sites of Interest:

1) 326 Second Street (Drury Lane), Cochrane, Ontario - Cochrane Shops -Includes Wayside Power Enclosure, Cochrane Coach Shop, Powerhouse, Fueling Facility, Wheel Drop Pit Shelter, & Main Shops (Diesel & Stores)
2) 200 Railway Street, Cochrane, Ontario - Cochrane Station Inn
3) 20 Boisvert Crescent, Cochrane, Ontario - Cochrane Yard Offices
4) 147 Second Street, Cochrane, Ontario - Cochrane Trainman's Bunkhouse
5) 100 Third Avenue, Cochrane, Ontario - Cochrane Freight Building

Ontario Northland provided the following screen captures (Figures 1 and 2) in order to correlate the locations of their buildings to the available distribution facilities in the area and data entered in the Distribution System Analysis tool.

Figure 1 – Cochrane Freight Building, Station Inn, Facilities and Bunkhouse Buildings

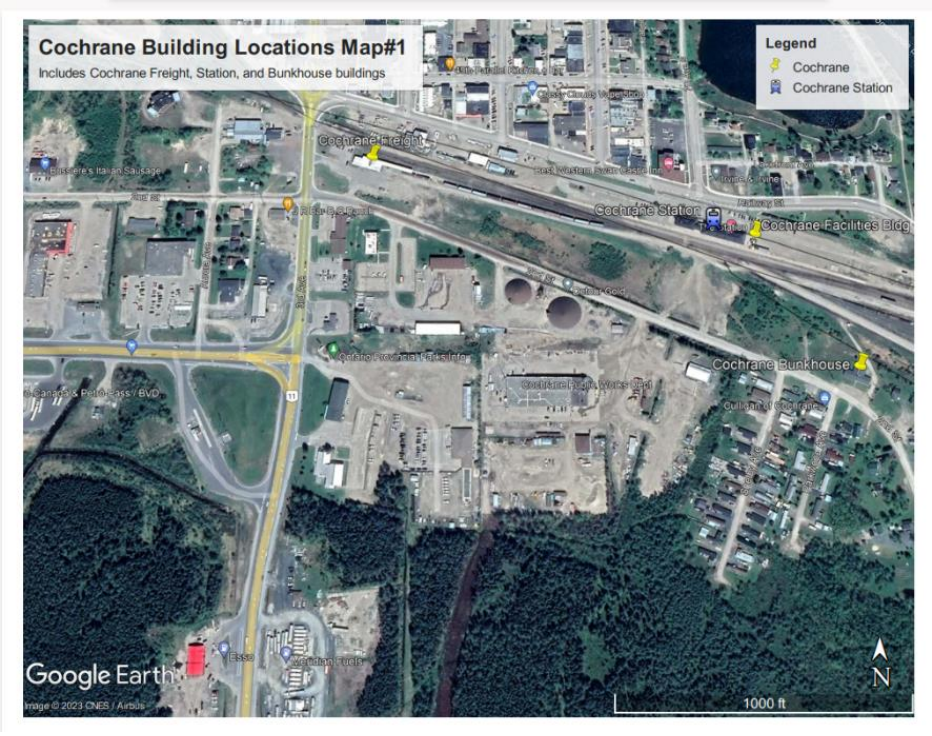


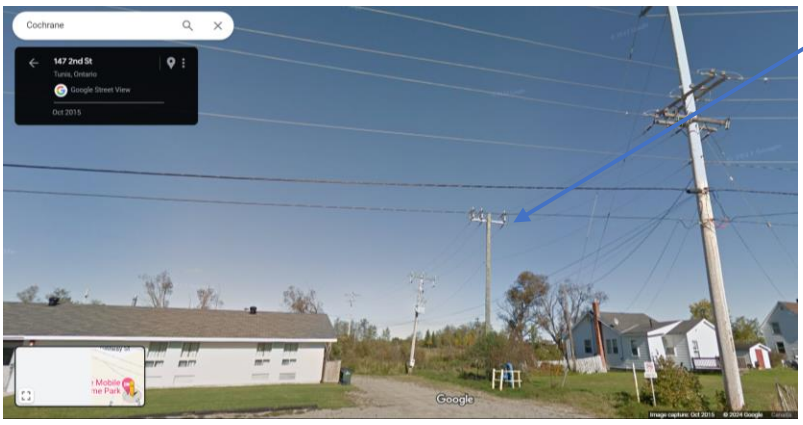
Figure 2 – Cochrane Yard Office, Fueling Facility, Wayside Power Enclosure, Powerhouse, Diesel Shop, Stores, Wheel Drop Pit, Coach Shop and Facilities Storage Dome



Upon further review of the following sites were determined to be served from a privately owned 25 kV distribution line with primary metering with a demarcation point of switch 195 located at 49 Second Street beside the Trainman Bunkhouse as per Figure 3 below:

1) 326 Second Street (Drury Lane), Cochrane, Ontario - Cochrane Shops - Includes Wayside Power Enclosure, Cochrane Coach Shop, Powerhouse, Fueling Facility, Wheel Drop Pit Shelter, & Main Shops (Diesel & Stores)
2) 200 Railway Street, Cochrane, Ontario - Cochrane Station Inn

Figure 3 – Switch 195 Location beside Trainman Bunkhouse



Northern Ontario Wires was able to provide fault level data at the gang operated switch 195 node 929 located at 49 Second Street.

A follow up request from Ontario Northland was received to investigate fault levels at the privately owned distribution transformers supplying service to the sites of interest.

Using the distribution system analysis model data for the privately owned transformers this report provides fault level data and information obtained from the distribution model. At the time the model was developed there was limited information available on distribution transformer so archetype data was used to produce the model. For the purposes of an arc flash study the distribution transformer archetypes used would contain transformer impedance values typical of those found on a distribution system network.

Supply Data:

- Supply distribution voltage is 24,900 V (25 kV) 3 phase, 4 wire
- Conductor size supplying the ONR is #2 ACSR
- Demarcation point is a gang operated switch 195
- 25 kV feeder protection is provided from a recloser located at the Cochrane MTS

Short Circuit Data

Please be advised that the information provided is approximate based on a simulated distribution model and information provided by Hydro One on the 115 kV supply.

X/R ratio at the 115 kV source is as follows:

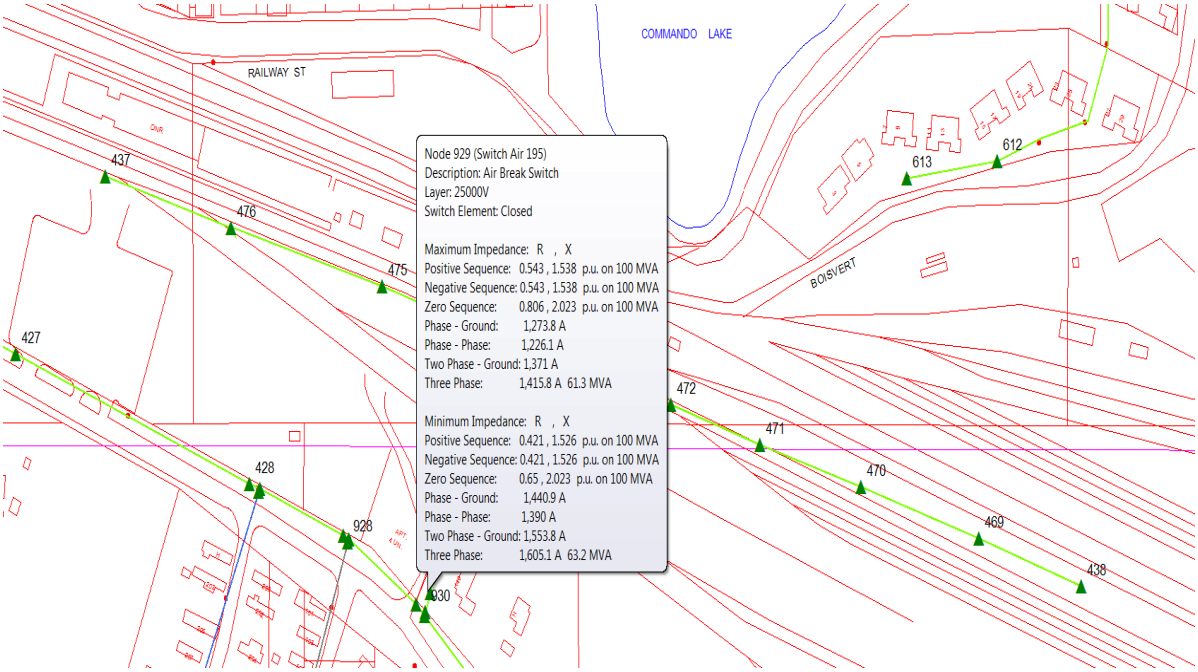
Max Fault Level:
3 Phase: 3.5
Ph – Grd: 3.39

Min Fault Level:
3 Phase: 2.03
Ph – Grd: 2.63

X/R Ratio at the Fault location Switch 195 (+ve Sequence)
Max Fault: 2.8
Min Fault: 3.6

At the gang operated switch 195 the following screen capture of minimum and maximum fault levels were simulated and shown in Figure 4:

Figure 4 Fault Data for the Demarcation Point Switch 195 Node 929



Arc Flash Data:

The arc flash data provided from the distribution model at the switch 195 is as follows:

Node: 929 (Switch Air 195) Arc Flash Study
12/5/2023 12:19:57 PM

General Parameters
Voltage: 25000 V
Grounded: True
Working Distance: 455 mm
Calculation Method: Theoretical Lee Method

Maximum Fault Conditions:
Fault Current: 2186.767 A
Arc Current: 2186.8 A
Incident Energy: 45.99 J/cm2

Minimum Fault Conditions:
Fault Current: 1819.215 A
Arc Current: 1819.2 A
Incident Energy: 50.16 J/cm2

Arc Flash Boundaries and Protection

Incident Energy: 50.16 J/cm2 or 11.99 cal/cm2
Flash Protection Boundary: 1441.2 mm or 56.7 in
Protection Level: 3

Through the use of google maps to cross reference the servicing of the buildings more information was able to obtain the following images of the building services and from that cross reference the transformer locations to the distribution model and run a simulation of the min and maximum available fault current and capture the archetype transformer data used in the distribution model.

326 Second Street (Drury Lane), Cochrane, Ontario - Cochrane Shops -Includes Wayside Power Enclosure, Cochrane Coach Shop, Powerhouse, Fueling Facility, Wheel Drop Pit Shelter, & Main Shops (Diesel & Stores)

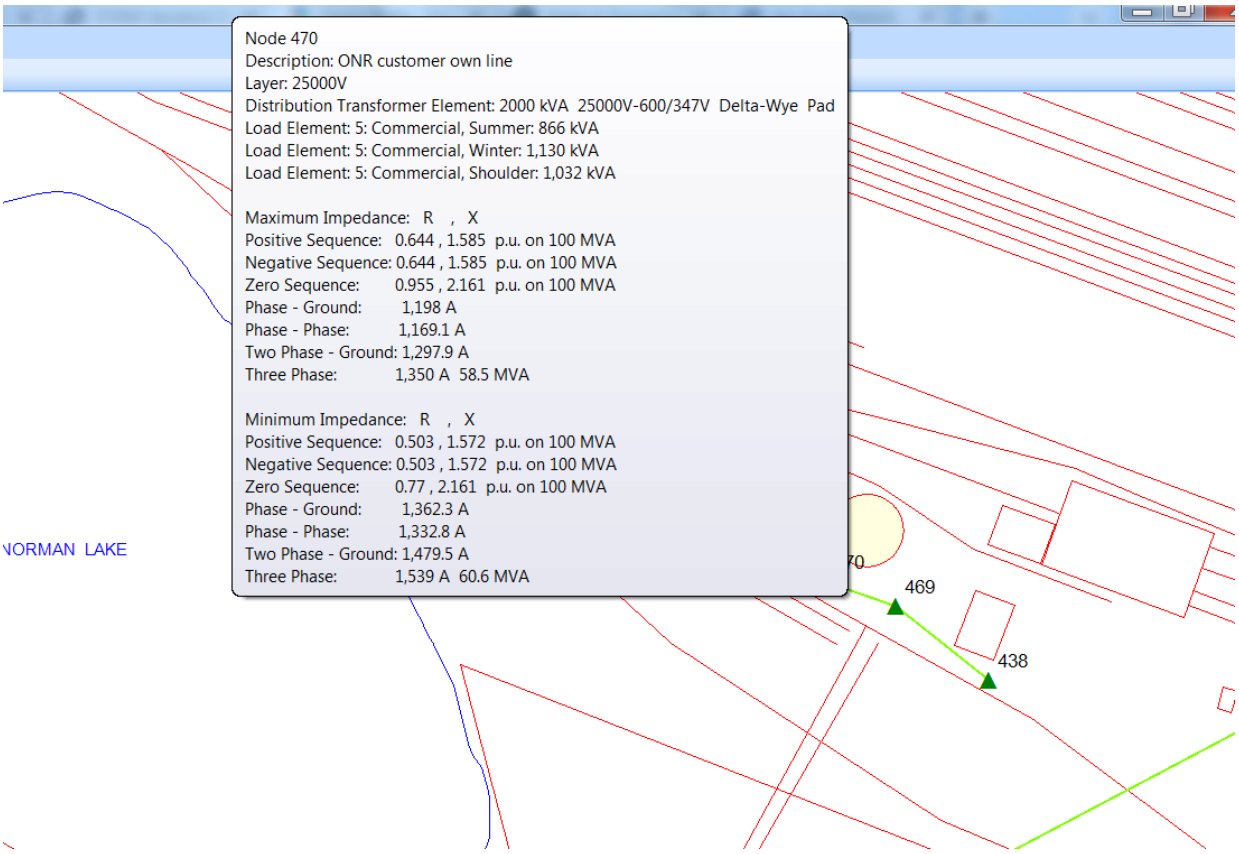
From the google maps data and model data there are multiple transformers on site that service the buildings at 326 Second Street. Determining the buildings supplied by these transformers need to be verified by the ONR as the distribution mapping only covers the primary supply and transformer information and excludes routing of secondary supply to the buildings. The google maps imagery in Figure 10 for this area is unclear on the pole attachments as it correlates to the transformers shown in the model.

Node 470 - 2.0 MVA 25 kV – 600Y/347 Power Transformer located near the Powerhouse building
Archetype Impedance:

R – 0.0101
X – 0.051
Z calculated=5.2%

Fault Data for Node 470 is per Figure 5 below:

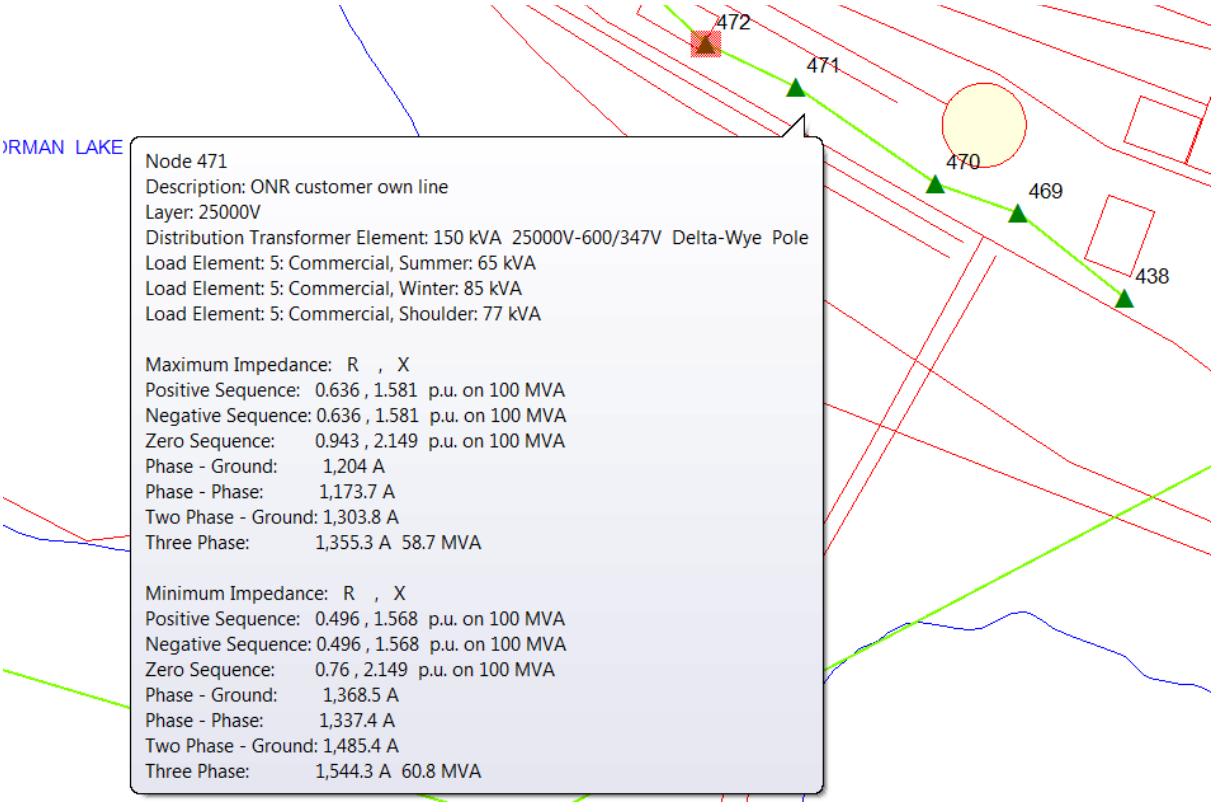
Figure 5 – Fault Data for 2.0 MVA Transformer near the Power House building



Node 471 - 150 kVA 25 kV – 600Y/347 padmounted transformer
Archetype Impedance:
R – 0.01
X – 0.05
Z calculated=5.1%

Fault Data for Node 471 is shown in Figure 6

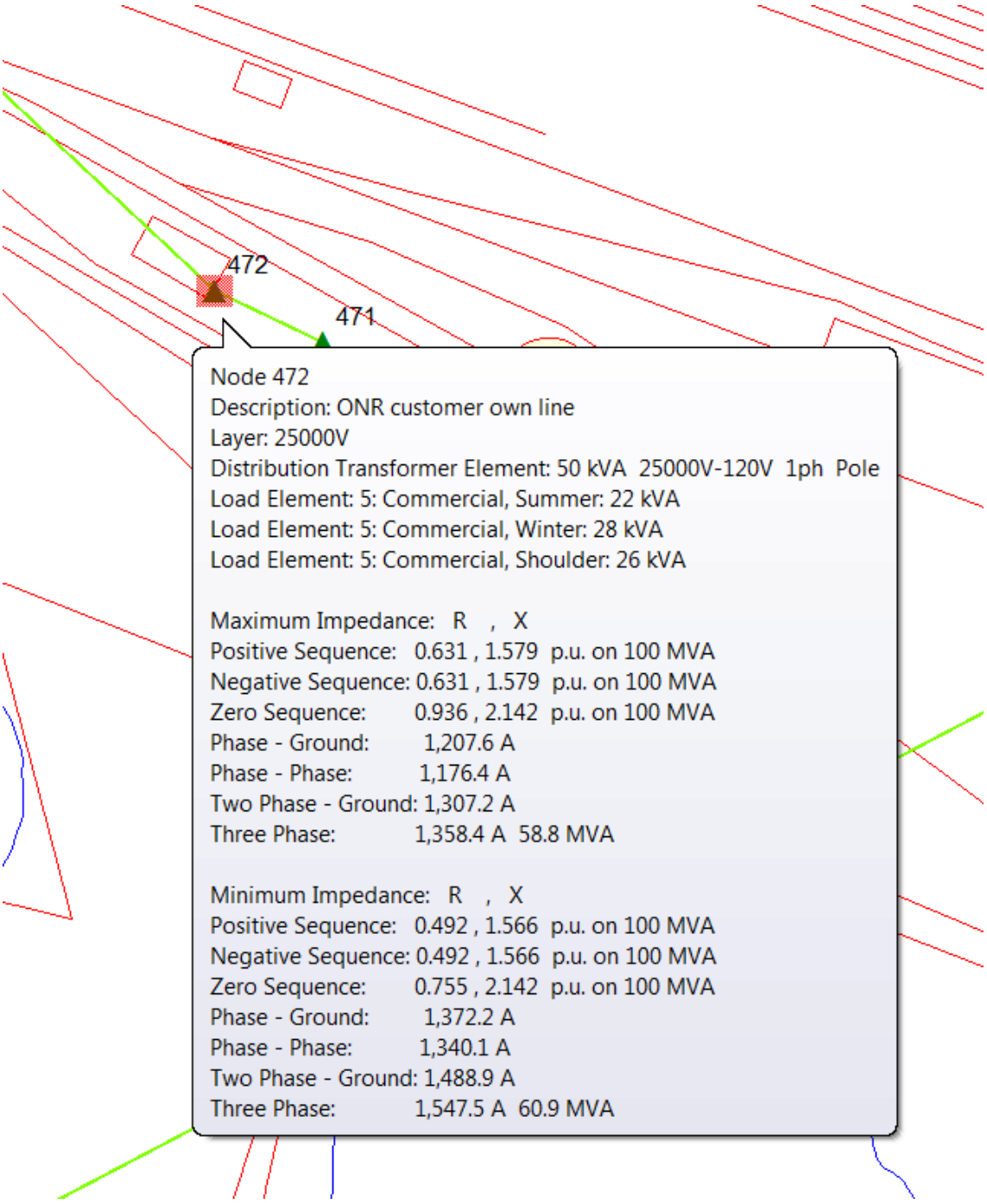
Figure 6 – Fault Data for 150 kVA Padmount Transformer Node 471



Node 472 - 50 kVA 14.3 kV – 120/240 V polemounted transformer
Archetype Impedance:
R – 0.0174
X – 0.049
Z calculated=5.2%

Fault data for Node 472 is shown in Figure 7.

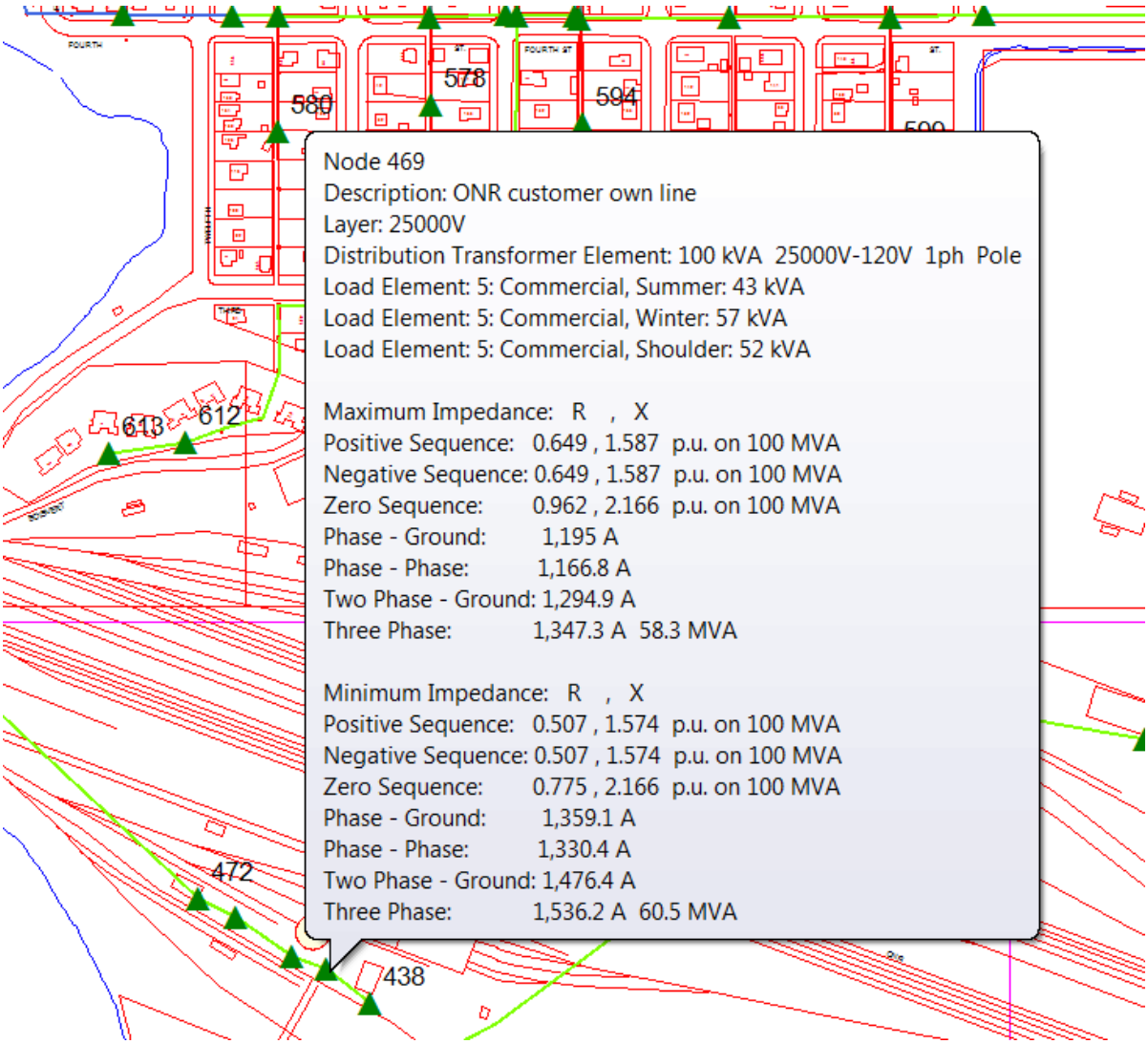
Figure 7 – Fault Data for Node 472



Node 469 –100 kVA 14.3 kV – 120/240 polemounted transformer
Archetype Impedance:
R – 0.0143
X – 0.05
Z calculated=5.2%

Fault Data for Node 469 is shown in Figure 8

Figure 8 – Fault Data for Node 469



Node 438 – 300 kVA 25 kV-600Y/347 V padmounted transformer

Archetype Impedance:
R – 0.0121
X – 0.0513
Z calculated=5.3%

Fault Data for Node 438 is illustrated in Figure 9

Figure 9 – Fault Data for Node 438

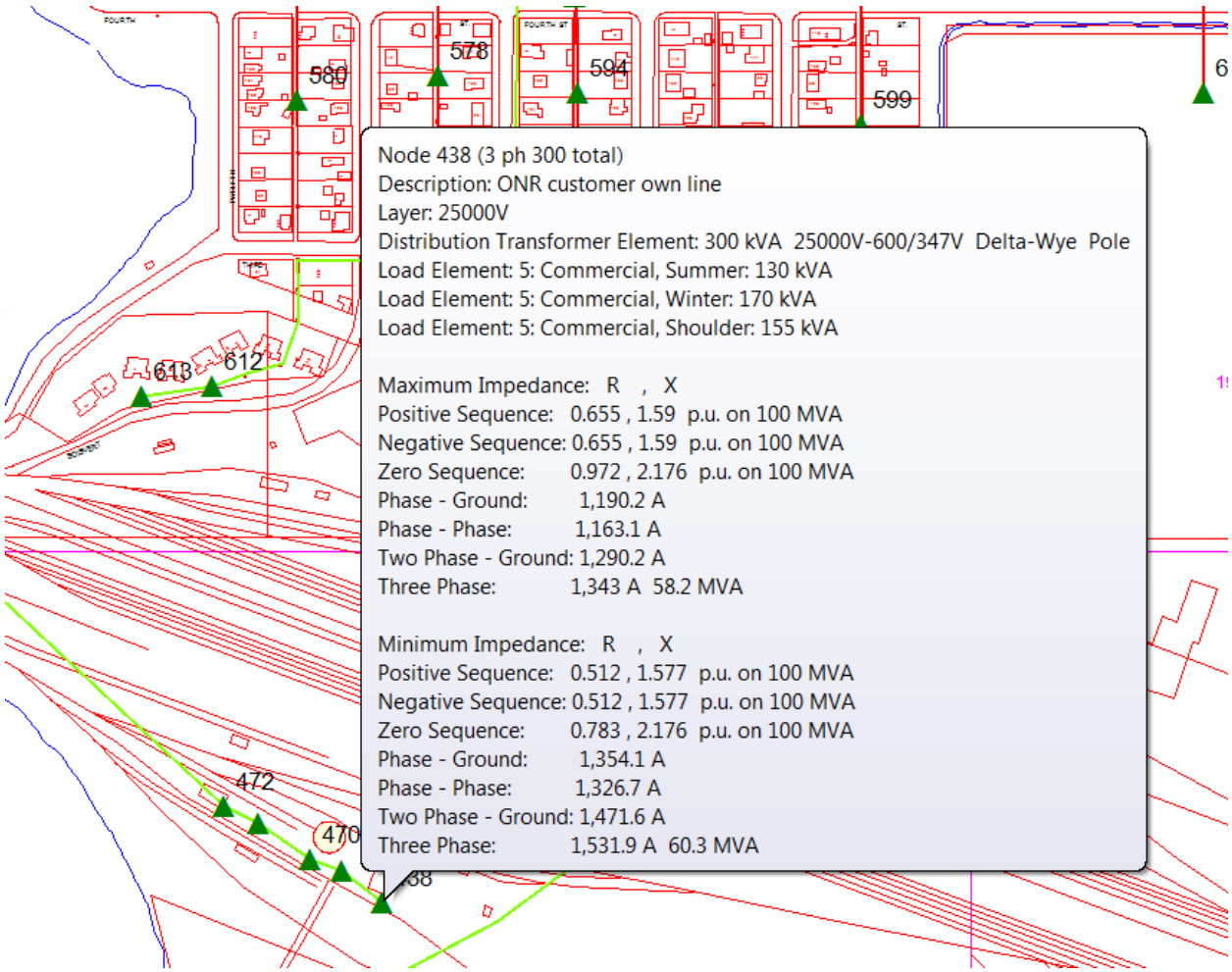


Figure 10 – Power House and Fueling Station Imagery from Google Maps



200 Railway Street, Cochrane, Ontario - Cochrane Station Inn

The imagery on google maps indicates the location of a padmounted transformer supplying the Cochrane Station Inn refer to Figure 11. The model data for node 437 indicates a 150 kVA 600/347 V padmounted transformer.

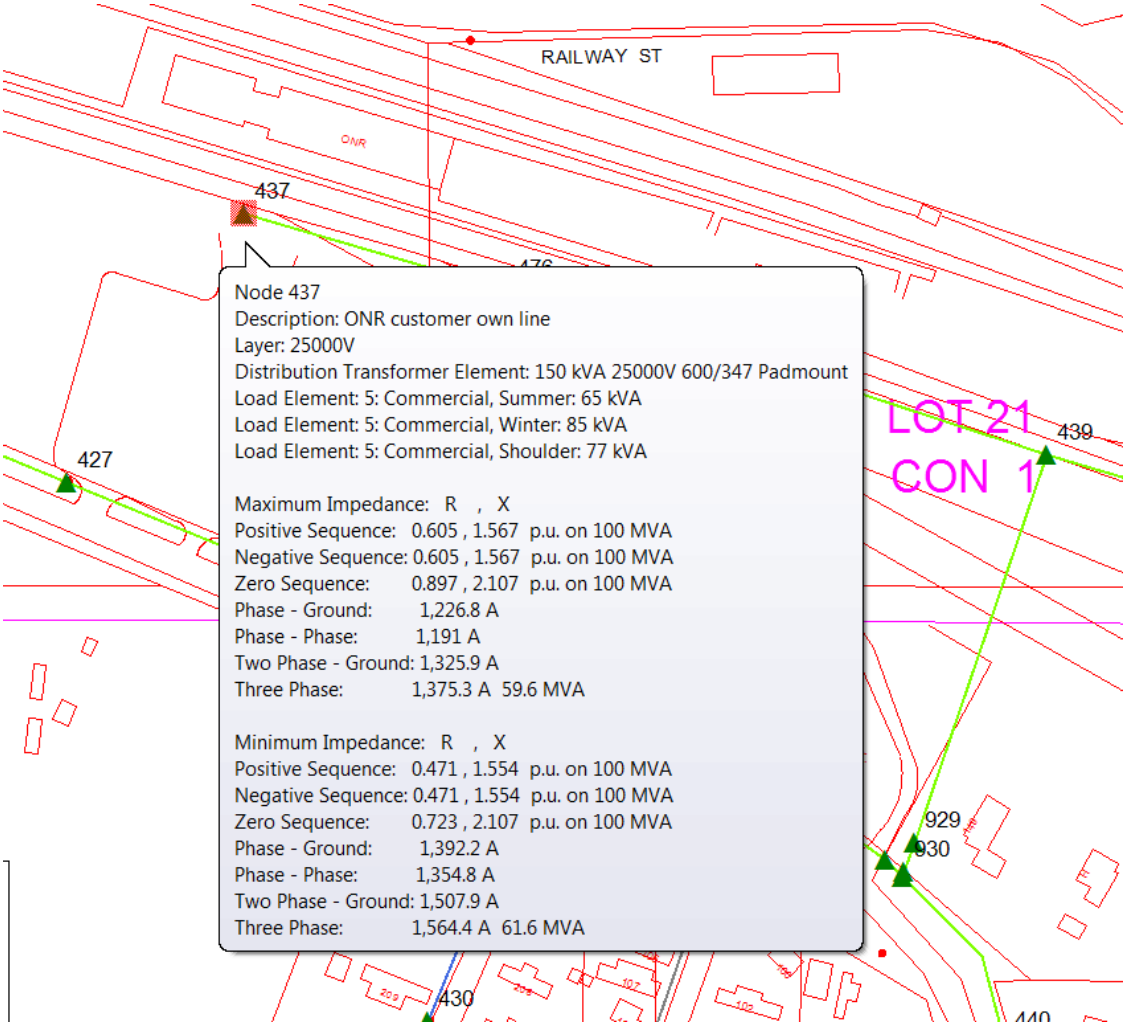
Archetype Impedance:
R – 0.0138
X – 0.0501
Z calculated=5.2%

Figure 11 – Station Inn Padmounted Transformer Location Google Maps Imagery



Fault data for the Station Inn is as per Figure 12 below:

Figure 12 – Station Inn Fault Data for Node 437

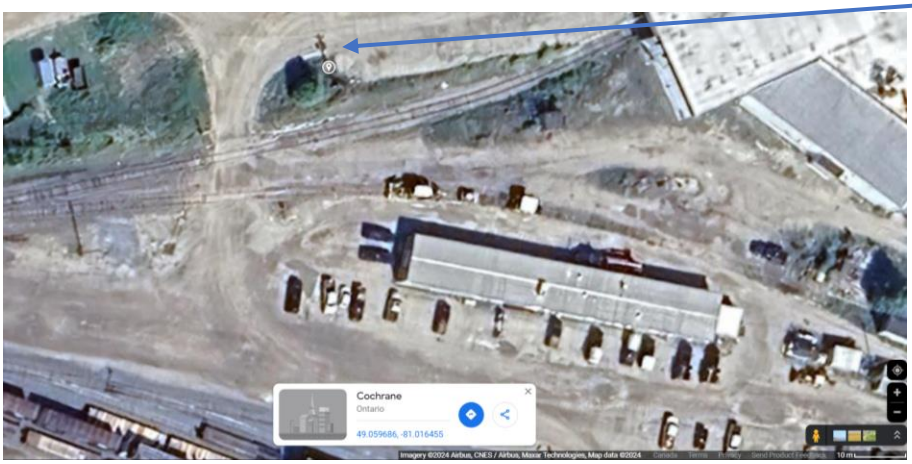


20 Boisvert Crescent, Cochrane, Ontario - Cochrane Yard Offices

The servicing to the Cochrane Yard Offices according to the model node 474 is from a 150 kVA 25 kV – 600Y/347V polemounted transformer. The google map imagery indicates the service is supplied from the 25 kV distribution system on Boisvert as shown in Figure 7.

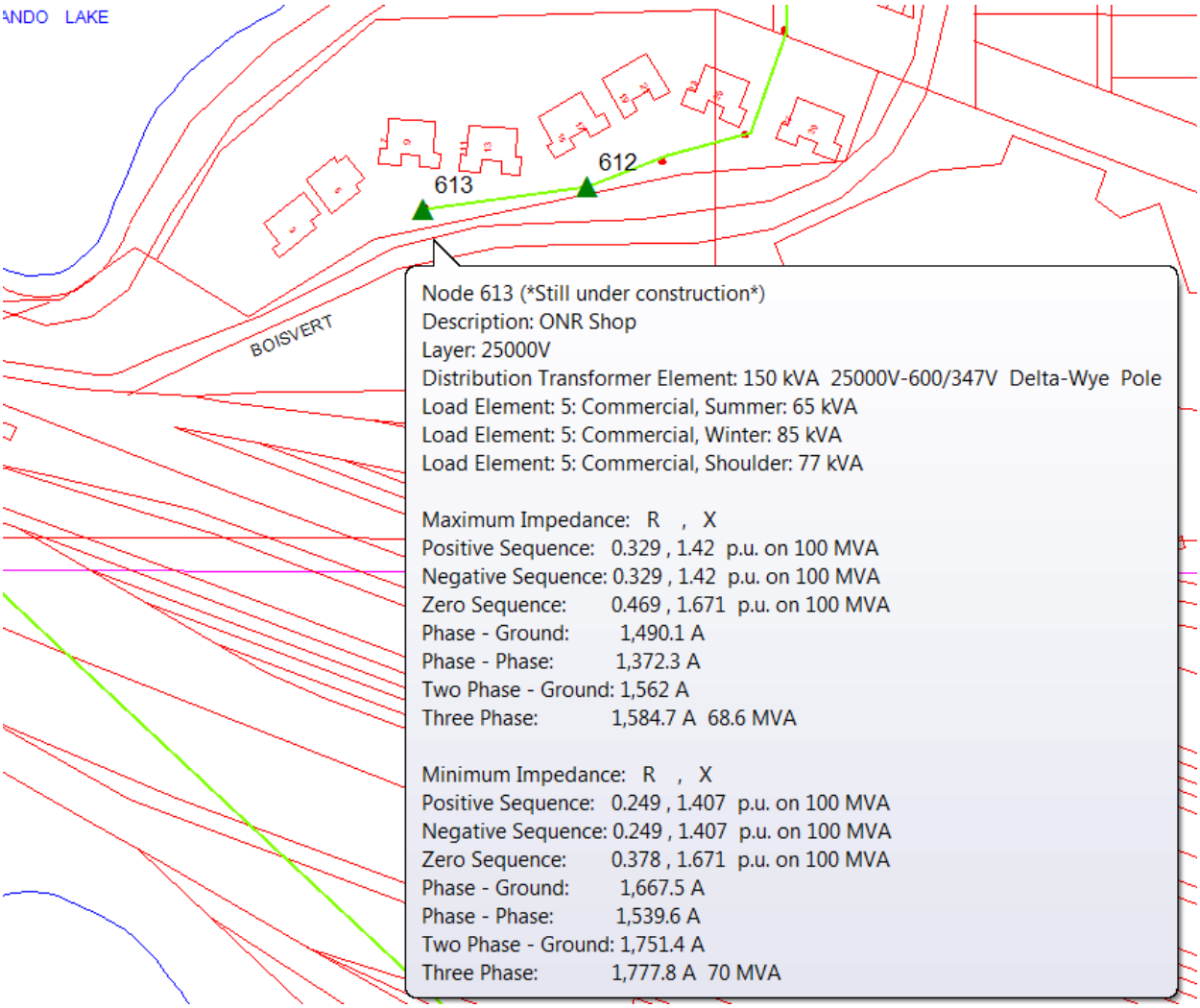
Archetype Impedance:
R – 0.0138
X – 0.0501
Z calculated=5.2%

Figure 13 Cochrane Yard Office Transformer location Google Maps Imagery



The fault data for 20 Boisvert Crescent is shown in Figure 14.

Figure 14 – Fault Data for 20 Boisvert Crescent



100 Third Avenue, Cochrane, Ontario - Cochrane Freight Building

As per Figure 15 below there is a 3 phase polemounted transformer bank connected to the Northern Ontario Wires 25 kV distribution system. There is a customer owned 3 phase underground secondary service attached to the pole that supplies the Cochrane Freight Building.

Figure 15 – Freight Building and Polemounted Transformer Bank Location



According to the data in the distribution model the transformer bank is 3 – 25 kVA units for a total of 75 kVA with a secondary Voltage of 600/347 V.

Connection configuration of the transformer bank is delta – wye.

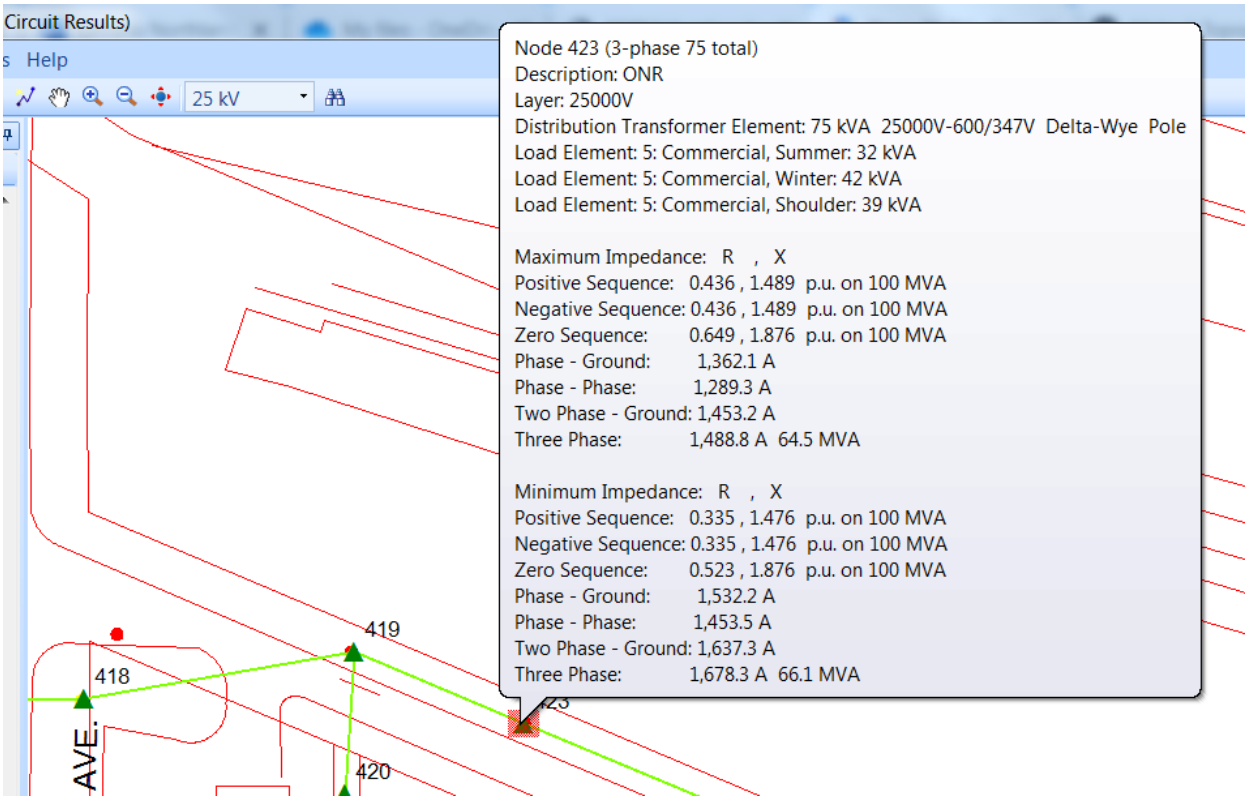
Archetype Impedance:

R – 0.0159
X – 0.0495
Z calculated 5.2%

The above image is the Cochrane Trainman's Bunkhouse which is supplied from the Northern Ontario Wires 25 kV distribution system three phase polemounted transformer which is a 3 – 50 kVA (150 kVA) 208Y/120 V bank. On the pole is a privately owned underground service which supplies power to the bunkhouse.

Fault data at the primary connection to the polemount transformer bank is shown in Figure 16:

Figure 16 – Fault Data for 100 Third Avenue Freight Building



147 Second Street, Cochrane, Ontario - Cochrane Trainman's Bunkhouse

Cochrane Trainman's Bunkhouse shown in Figure 17 below is supplied from the Northern Ontario Wires 25 kV distribution system three phase polemounted transformer which is a 3 – 50 kVA (150 kVA) 208Y/120 V bank. On the pole is a privately owned underground service which supplies power to the bunkhouse.

Figure 17 – Trainman's Bunkhouse and Polemounted Transformer Bank Location

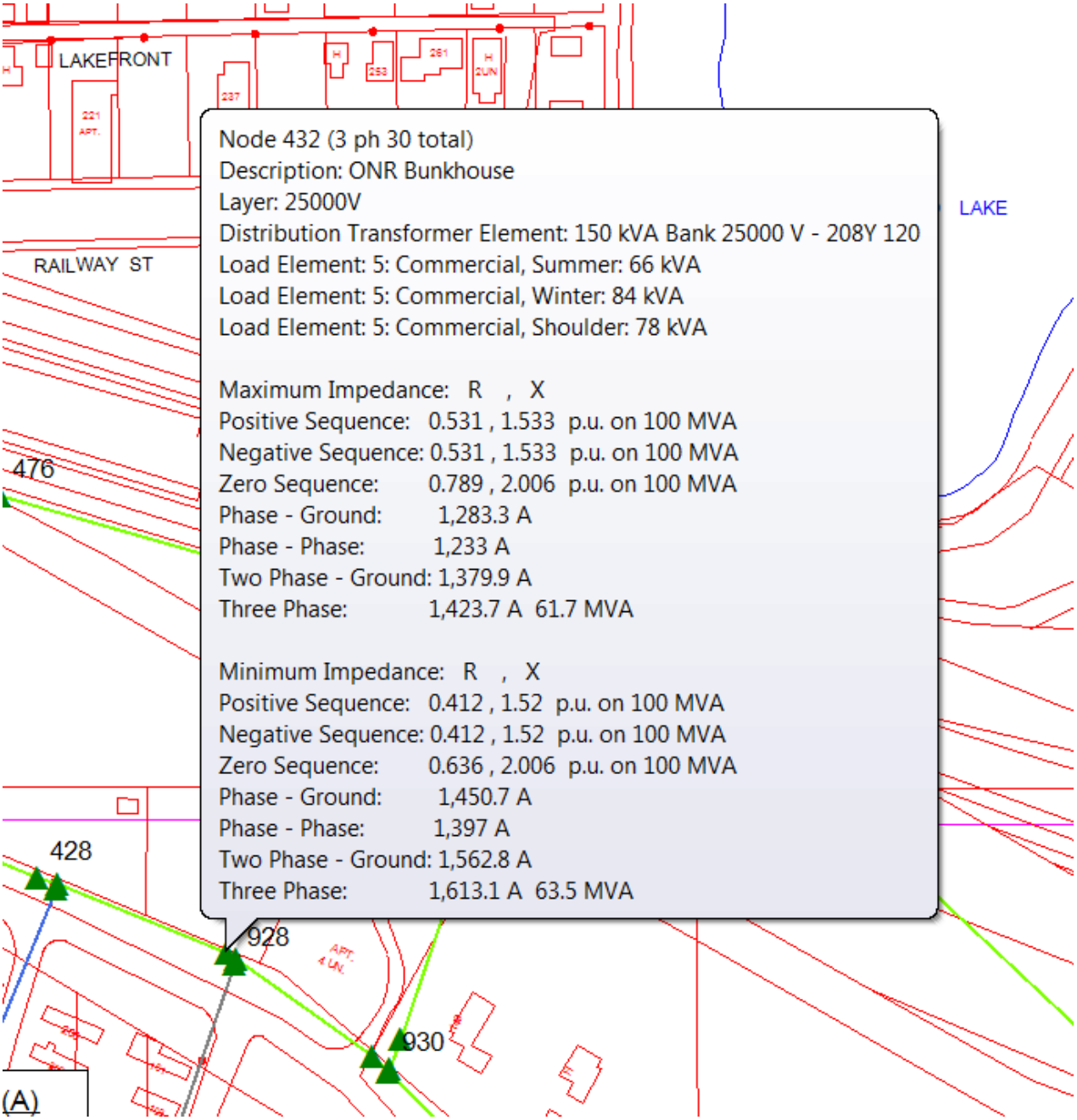


Transformer bank Archetype Impedance:

R – 0.01
X – 0.02
Z calculated 2.2%

Model Fault levels at the primary connection to the polemount transformer bank for the bunkhouse are shown in Figure 18 below:

Figure 18 – Fault Data for 147 Second Street Bunkhouse



Summary notes on Supply to the Ontario Northland Buildings:

With the screen captures provided by the Ontario Northland it was determined that 3 building sites were supplied directly from the Northern Ontario Wires distribution system and two sites with multiple buildings were suppled from the Ontario Northland privately owned 25 kV distribution line. This follow up report contains fault data for all Ontario Northland screen captured sites of interest and the work to provide transformer impedance and fault data for those sites supplied by the Ontario Northland privately owned line is chargeable back to the Ontario Northland.

Disclaimer:

The data provided from the model of the distribution system in Cochrane Ontario and contains archetype data for distribution transformers and known source impedance data supplied from Hydro One. Brian Smith Consultant will not be held liable for the accuracy of the information produced from the distribution model provided in this report.

NOW - Tx PCB

Completed By	Frodis, Jamie
Completed On	07-29-2024 09:49

INSPECTION / SAMPLING

NOW Sites

80032 - (R)

To edit on this page - Click EDIT

EDIT

Date

07-29-2024

Name:

Truck53 Valard

Email:

OntOpTruck53@valard.com

Company / Vendor

Valard

Pole #

80032

Current Status

300 Does not need a sample: 1981 or newer

INSPECTION / SAMPLING

Inspection

Transformer Type in data

POLEMOUNT

Pole / Padmount

POLEMOUNT

Municipality

Cochrane

Feeder #

25kv W

Lat / Long rounded

49.060482 -81.028571

LOCATION INFO

To edit or annotate photos and Barcodes - Click EDIT

EDIT

Pole #

80032

Owner in Customer data

N.O.W

Owner - Accept / Change (above)

ACCEPT

Updated Accessibility

Roadside

Accessibility - Accept / Change (above)

ACCEPT

Access

4

Access photo



Updated OP DES

052

OP DES - Accept / Change (above)

ACCEPT

OP DES photo



In there a RED-TAG on the equipment?

No

Electrical Hazard Signs

2

Electrical Hazard Signs photo



From STREET showing Equipment photo



No Barcode on Pole

NO Barcode

Pole Barcode ${9} Enter manually if NOT scanned

No Barcode

Pole Barcode Photo



Equipment Needed for Sampling/Revisit OR Future Work

Squirt bucket - No Mats

FLOC Year NOT on Pole

NO FLOC Year

Updated Pole Label Stamp Year

Not present

Pole Label Stamp Year - Accept / Change (above)

ACCEPT

Pole Label Stamp Year photo



Ground Lead Attachments

4

Ground Lead Attachments photo



Ground Wires & Arrestors

3

Ground Wires & Arrestors photo



Bird or Animal Nests

1

Transformers / Equipment in Customer data

3

Number of Transformers on Pole

3

EQUIPMENT on Pole - Select all that apply

Cutout

Cutout Switch Count

3

TRANSFORMERS / EQUIPMENT

Equipment Table

NOW

80032 - (R)

NOW
80032 - (R)
80032 - (R)
Date Sampled / Visited
07-29-2024
Equipment
1
Hydro One Data Count
3
Equipment on Pole Count
3
Equipment Description
80032 - (R)
Updated Phase Colour
Unknown
Phase Colour Correct (above)
ACCEPT
Is switch Open or Closed?
Closed
Equipment switch photo



Is there a phase / colour circle marker on the equipment?

No

Equipment

80032 - (R)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

80032

Equipment Key

80032 - (R)

Current Status

300 Does not need a sample: 1981 or newer

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

25

Bil KV

0

Current Lim Fuse

Yes

Impedance (Z)

18

Front Pad

N/a

Feed Pad

N/a

Switch Pad

N/a

Weight (kg)

143

Primary Volume 1

N/a

Primary Volume 2

N/a

Secondary Volume

N/a

Dual Volume

N/a

Primary Tap Charger

N/a

Tap Position

N/a

In Service / Out of Service

In Service

Forestry Required

No

Paint - Corrosion

3

Paint - Corrosion photo



Leaking Oil

1

Heating or Discolouration

3

Heating or Discolouration photo



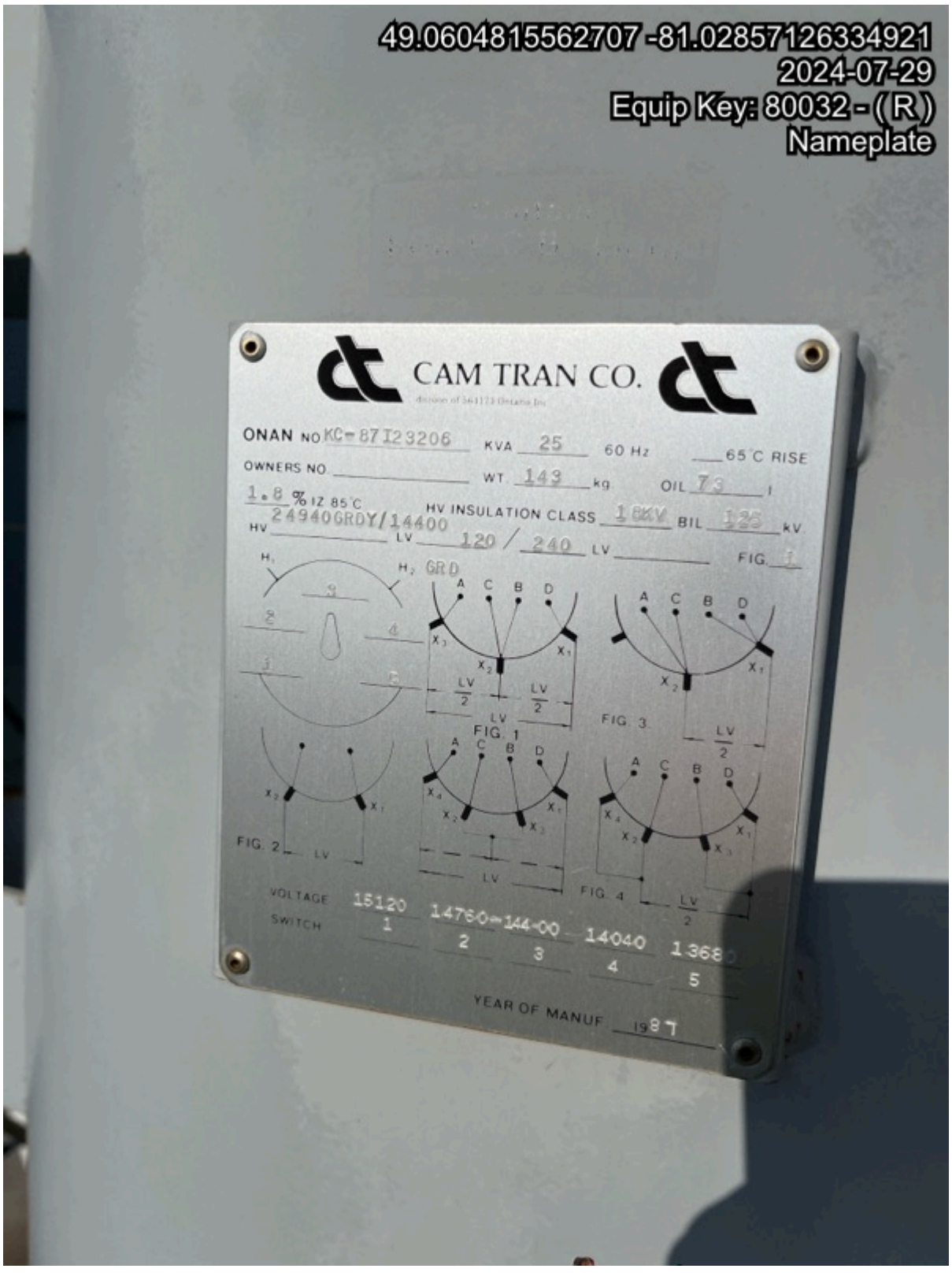
Connections Condition

4

Connections Condition photo


49.0604815562707 -81.028571263349 21
2024-07-29
80032
Connection Condition - 4

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

1987

Manufacturer

CAM TRAN Co.

Serial #

KC-87I23206

Equipment Table

To edit data and Barcodes or annotate photos - Click EDIT

EDIT

NOW

80032 - (W)

NOW

80032 - (W)

80032 - (W)

Date Sampled / Visited
07-29-2024
Equipment
2
Hydro One Data Count
3
Equipment on Pole Count
3
Equipment Description
80032 - (W)
Updated Phase Colour
Unknown
Phase Colour Correct (above)
ACCEPT
Is switch Open or Closed?
Closed
Equipment switch photo



Is there a phase / colour circle marker on the equipment?

No

Equipment

80032 - (W)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

80032

Equipment Key

80032 - (W)

Current Status

300 Does not need a sample: 1981 or newer

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

25

Bil KV

0

Current Lim Fuse

Yes

Impedance (Z)

18

Front Pad

N/a

Feed Pad

N/a

Switch Pad

N/a

Weight (kg)

143

Primary Volume 1

N/a

Primary Volume 2

N/a

Secondary Volume

N/a

Dual Volume

N/a

Primary Tap Charger

N/a

Tap Position

N/a

In Service / Out of Service

In Service

Forestry Required

No

Paint - Corrosion

3

Paint - Corrosion photo



Leaking Oil

1

Heating or Discolouration

3

Heating or Discolouration photo



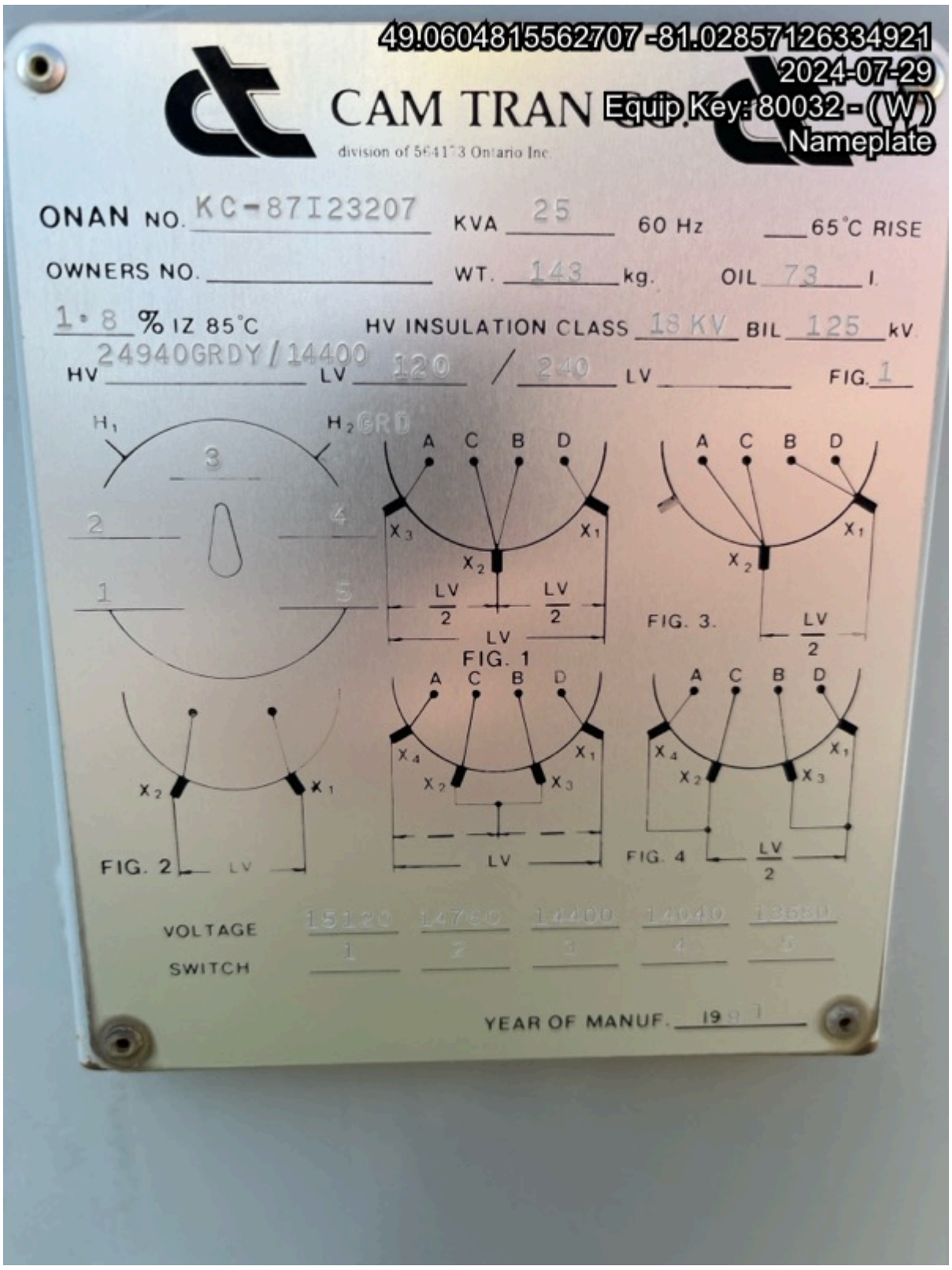
Connections Condition

4

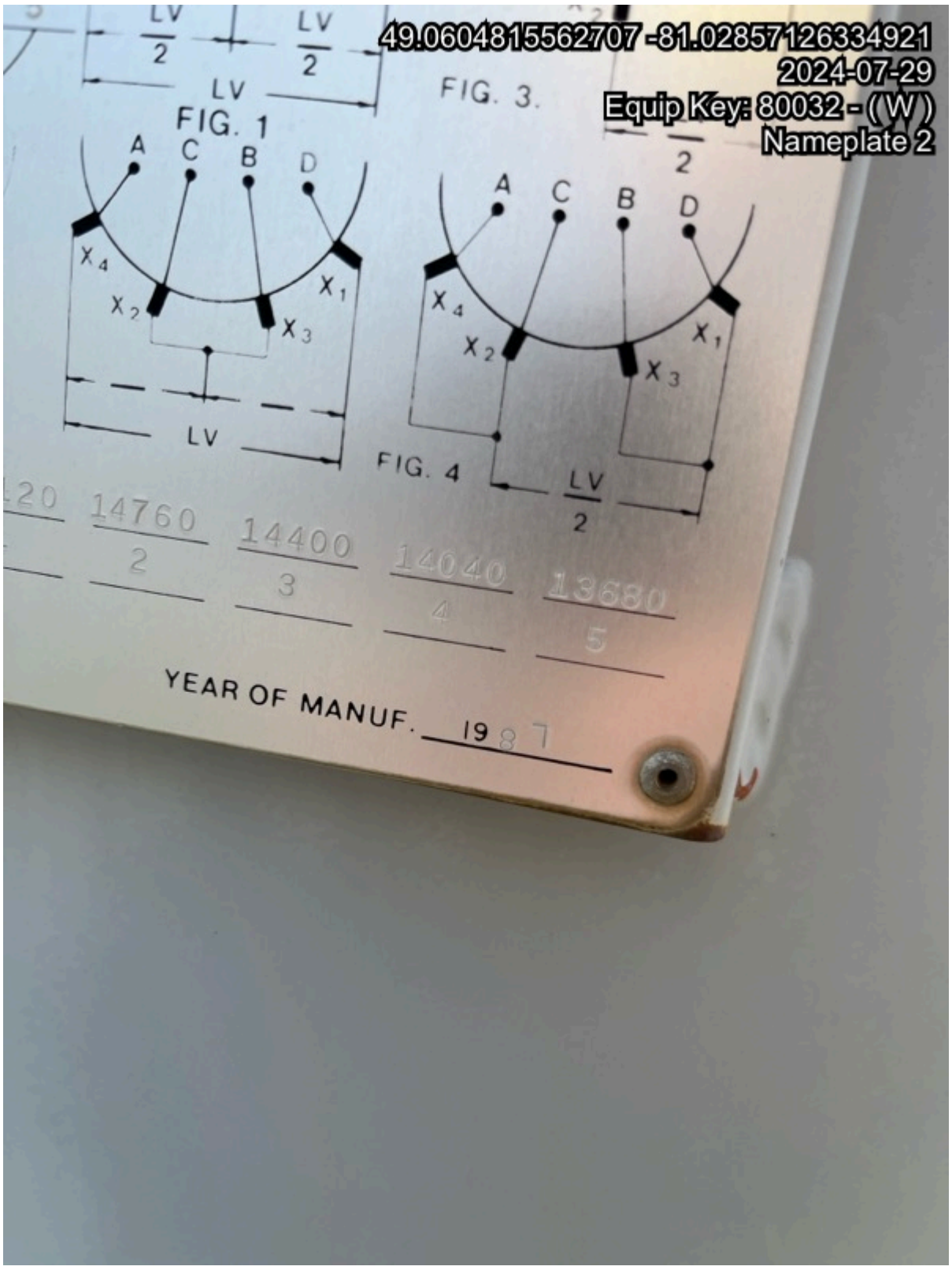
Connections Condition photo


49.0604815562707 -81.028571263349 21
2024-07-29
80032
Connection Condition - 4

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

1987

Manufacturer

CAM TRAN Co.

Serial #

KC-87I23207

Equipment Table

NOW

80032 - (B)

NOW

80032 - (B)

80032 - (B)

Date Sampled / Visited

07-29-2024

Equipment

3

Hydro One Data Count

3

Equipment on Pole Count

3

Equipment Description

80032 - (B)

Updated Phase Colour

Unknown

Phase Colour Correct (above)

ACCEPT

Is switch Open or Closed?

Closed

Equipment switch photo



Is there a phase / colour circle marker on the equipment?

No

Equipment

80032 - (B)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

80032

Equipment Key

80032 - (B)

Current Status

000 Needs sample

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

25

Bil KV

0

Current Lim Fuse

No

Impedance (Z)

18

Front Pad

N/a

Feed Pad

N/a

Switch Pad

N/a

Weight (kg)

143

Primary Volume 1

N/a

Primary Volume 2

N/a

Secondary Volume

N/a

Dual Volume

N/a

Primary Tap Charger

N/a

Tap Position

N/a

In Service / Out of Service

In Service

Forestry Required

No

Paint - Corrosion

3

Paint - Corrosion photo



Leaking Oil
5
Leaking Oil photo



Heating or Discolouration

3

Heating or Discolouration photo



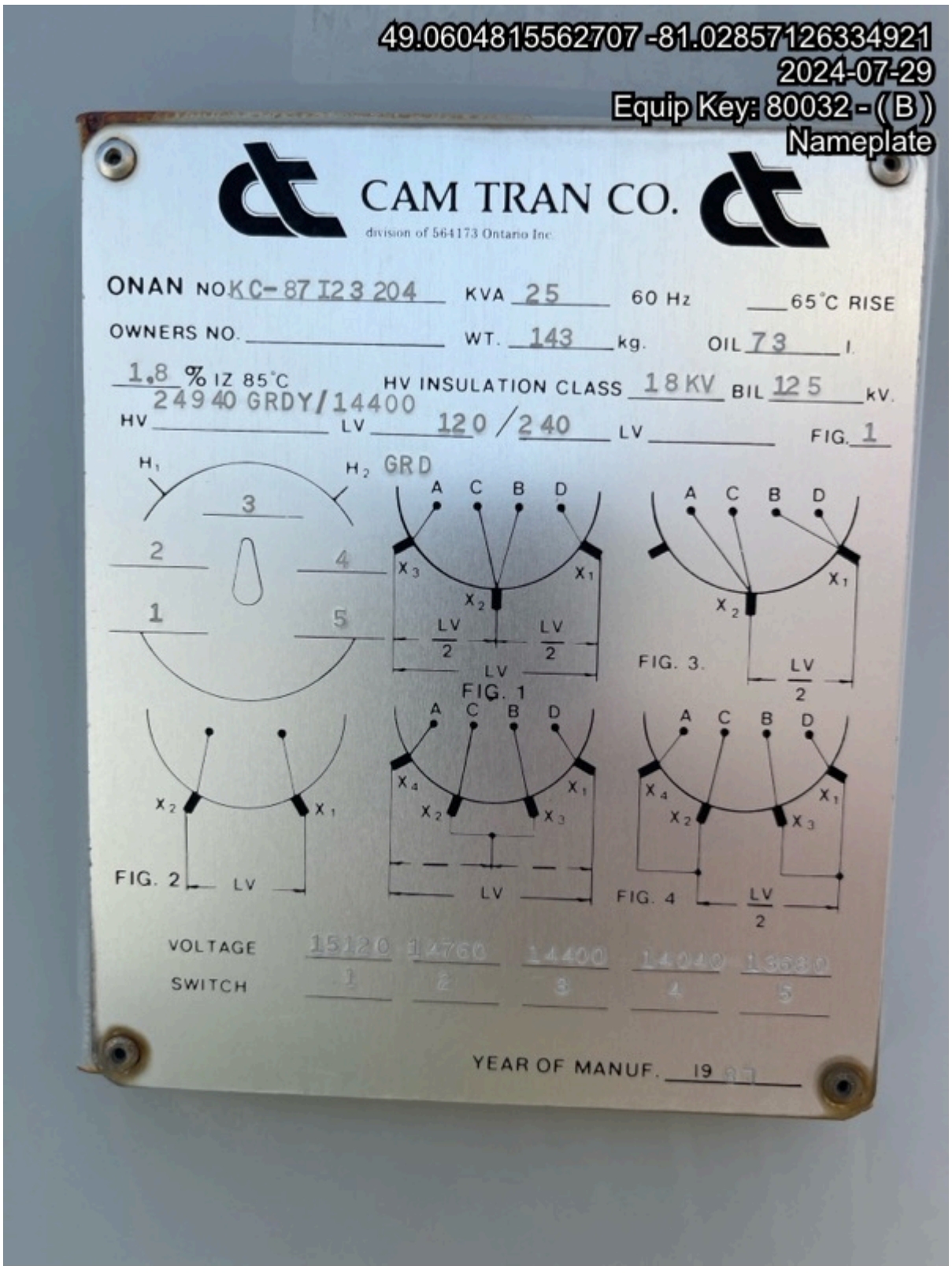
Connections Condition

4

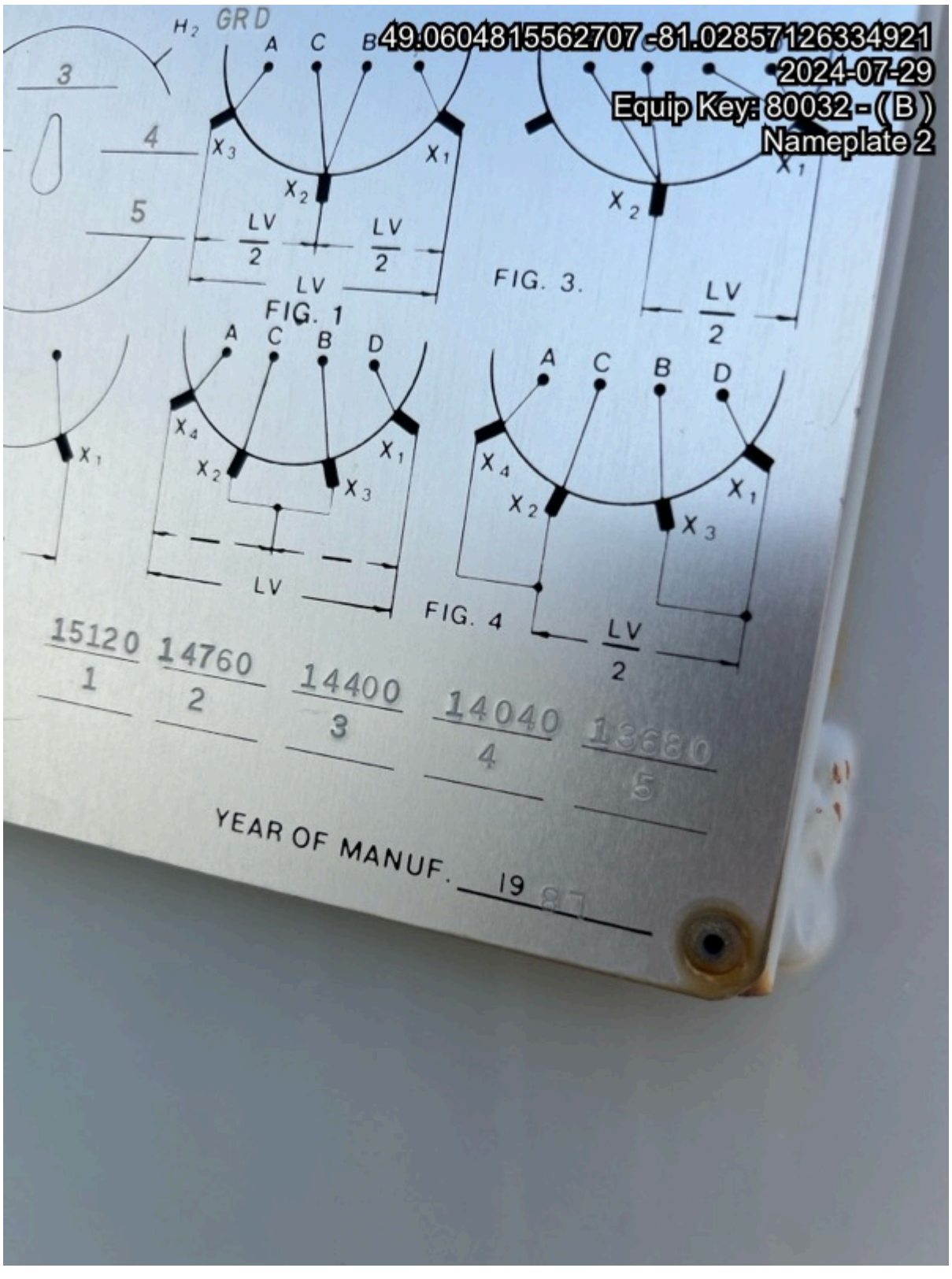
Connections Condition photo


49.0604815562707 -81.028571263349 21
2024-07-29
80032
Connection Condition - 4

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

1987

Manufacturer

CAM TRAN Co.

Serial #

KC-87I23204

SUBMIT

Was traffic control used to complete this site?

Yes

Asset Info Matches GIS

5

Customer Interaction

No

Did you leave a notice for the customer?

No

Ready to Submit INSPECTION

COMPLETED

REVIEW

Date

07-29-2024

Inspection

ACCEPT

General and Oil Sample Comments Combined

#1 - 80032 - (R)
Original: 80032 - (R)
Current: POLEMOUNT
STATUS: 300 Does not need a sample: 1981 or newer

#2 - 80032 - (W)
Original: 80032 - (W)
Current: POLEMOUNT
STATUS: 300 Does not need a sample: 1981 or newer

#3 - 80032 - (B)
Original: 80032 - (B)
Current: POLEMOUNT
STATUS: 300 Does not need a sample: 1981 or newer

BACK STEP / CLOSE

NOW - Tx PCB (version 2)

NOW - Tx PCB

Completed By	Bantug, Catherine
Completed On	07-02-2024 13:49

INSPECTION / SAMPLING

NOW Sites

79977 - (R)

Date

07-02-2024

Name:

Truck52 Valard

Email:

OntOpTruck52@valard.com

Company / Vendor

Valard

Pole #

79977

Current Status

Open

INSPECTION / SAMPLING

Inspection

Transformer Type in data

POLEMOUNT

Pole / Padmount

POLEMOUNT

Municipality

Cochrane

Feeder #

25kv W

Lat / Long rounded

49.058557 -81.021615

LOCATION INFO

To edit or annotate photos and Barcodes - Click EDIT

EDIT

Pole #

79977

Owner in Customer data

N.O.W

Owner - Accept / Change (above)

ACCEPT

Accessibility - Accept / Change (above)

CHANGE

Update Accessibility

Roadside

Access

3

Access photo



OP DES - Accept / Change (above)

CHANGE

Update OP DES

061

OP DES photo



In there a RED-TAG on the equipment?

No

Electrical Hazard Signs

1

Electrical Hazard Signs photo



From STREET showing Equipment photo



No Barcode on Pole

NO Barcode

Pole Barcode ${9} Enter manually if NOT scanned

No Barcode

Pole Barcode Photo



Equipment Needed for Sampling/Revisit OR Future Work

Squirt bucket - No Mats

FLOC Year NOT on Pole

NO FLOC Year

Pole Label Stamp Year photo



Ground Lead Attachments

3

Ground Lead Attachments photo



Ground Wires & Arrestors

3

Ground Wires & Arrestors photo



Bird or Animal Nests

1

Transformers / Equipment in Customer data

3

Number of Transformers on Pole

3

No Additional Equipment on pole

No Additional Equipment

TRANSFORMERS / EQUIPMENT

Equipment Table

To edit data and Barcodes or annotate photos - Click EDIT

EDIT

NOW

79977 - (R)

NOW
79977 - (R)
79977 - (R)
Date Sampled / Visited
07-02-2024
Equipment
1
Hydro One Data Count
3
Equipment on Pole Count
3
Equipment Description
79977 - (R)
Phase Colour Correct (above)
UNKNOWN
Equipment switch photo



Equipment

79977 - (R)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

79977

Equipment Key

79977 - (R)

Current Status

Open

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

0

Bil KV

0

Current Lim Fuse

No

Impedance (Z)

0

Front Pad

Na

Feed Pad

Na

Switch Pad

Na

Weight (kg)

0

Primary Volume 1

Na

Primary Volume 2

Na

Secondary Volume

Na

Dual Volume

Na

Primary Tap Charger

Na

Tap Position

Na

In Service / Out of Service

In Service

Forestry Required

No

Paint - Corrosion

3

Paint - Corrosion photo



Leaking Oil

1

Heating or Discolouration

3

Heating or Discolouration photo



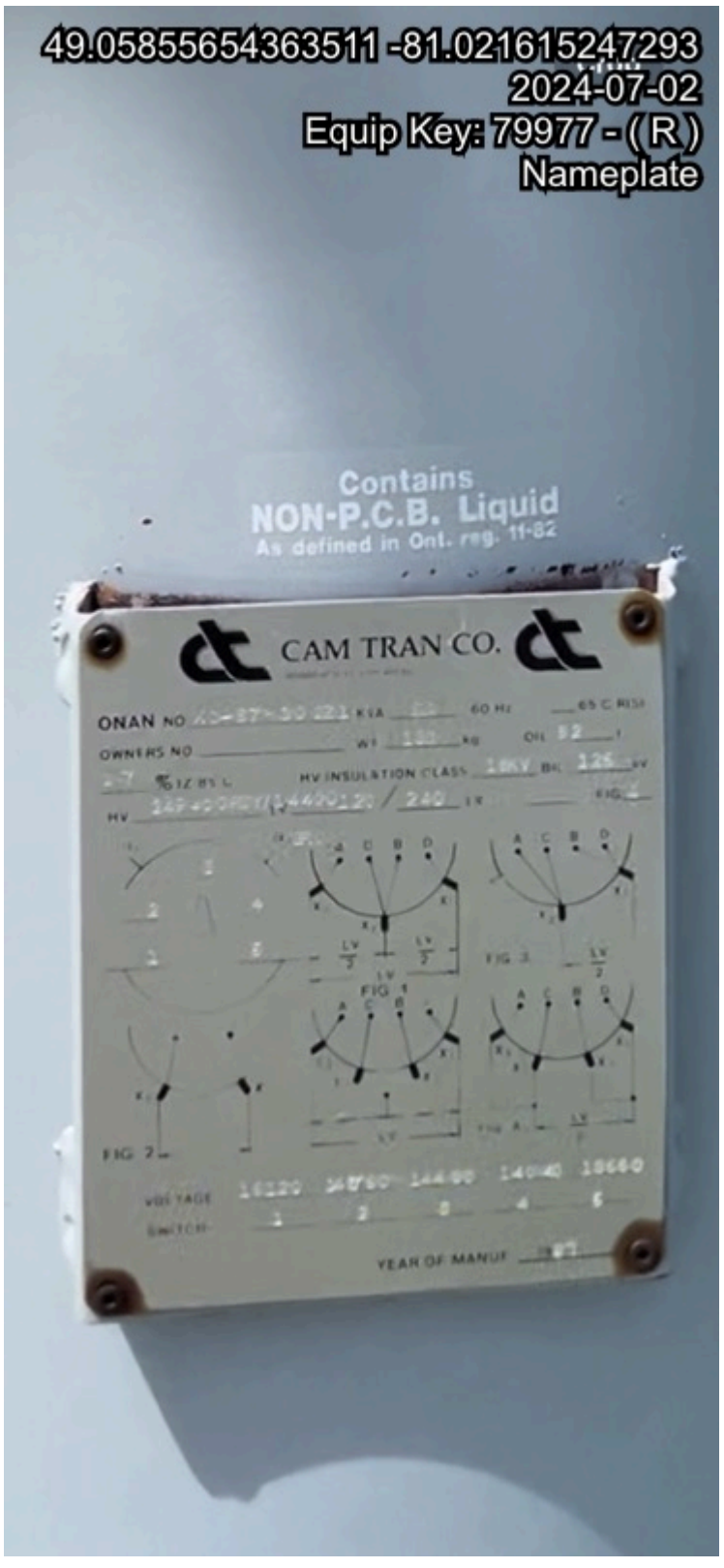
Connections Condition

3

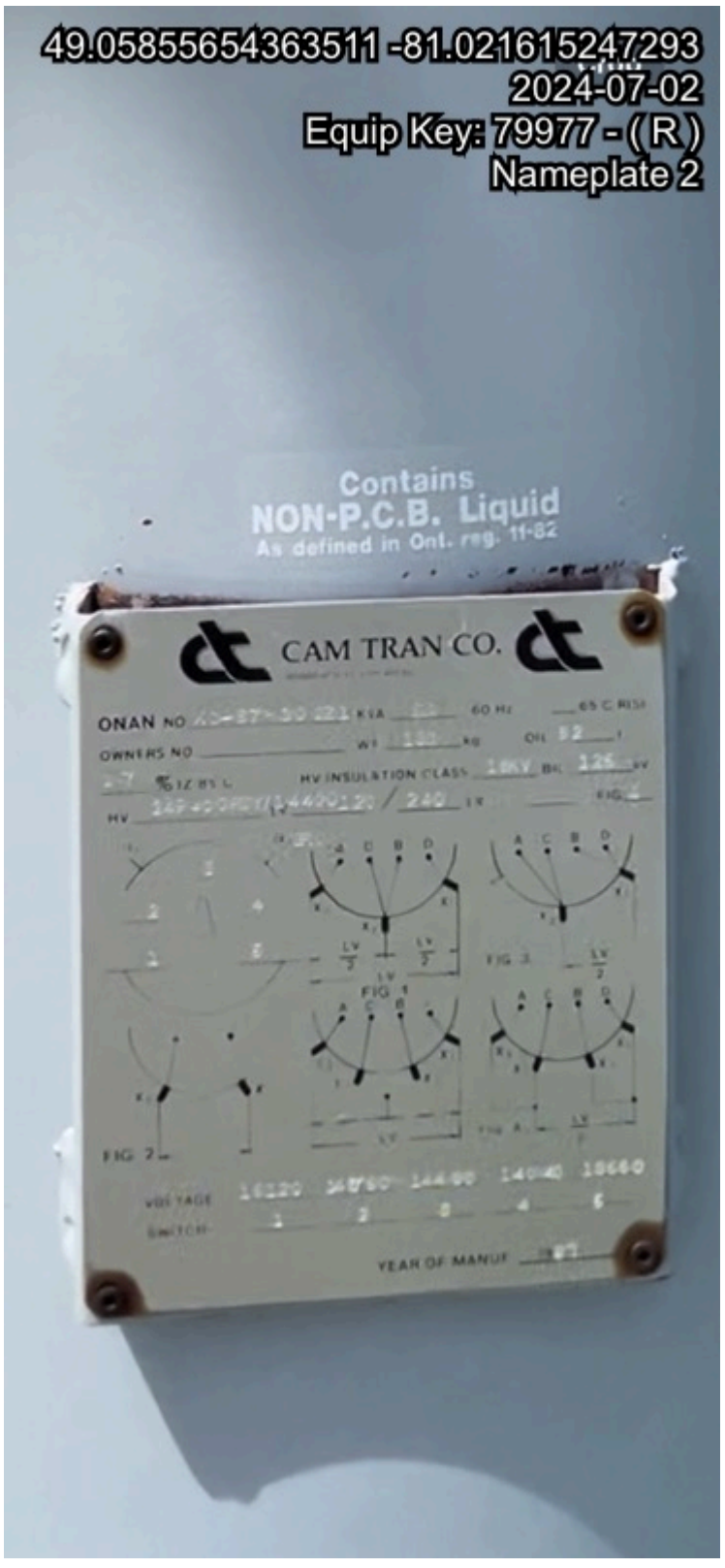
Connections Condition photo


49.05855654363511 -81.021615247293
2024-07-02
79977
Connection Condition - 3

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

1987

Manufacturer

CAM TRAN Co.

Serial #

20-87-50-221

Equipment Table

To edit data and Barcodes or annotate photos - Click EDIT

EDIT

NOW

79977 - (B)

NOW

79977 - (B)

79977 - (B)

Date Sampled / Visited

07-02-2024

Equipment

2

Hydro One Data Count

3

Equipment on Pole Count

3

Equipment Description

79977 - (B)

Phase Colour Correct (above)

UNKNOWN

Equipment switch photo



Equipment

79977 - (B)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

79977

Equipment Key

79977 - (B)

Current Status

Open

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

0

Bil KV

0

Current Lim Fuse

No

Impedance (Z)

0

Front Pad

Na

Feed Pad

Na

Switch Pad

Na

Weight (kg)

0

Primary Volume 1

Na
Primary Volume 2
Na
Secondary Volume
Na
Dual Volume
Na
Primary Tap Charger
Na
Tap Position
Na
In Service / Out of Service
In Service
Forestry Required
No
Paint - Corrosion
3
Paint - Corrosion photo



Leaking Oil

1

Heating or Discolouration

3

Heating or Discolouration photo



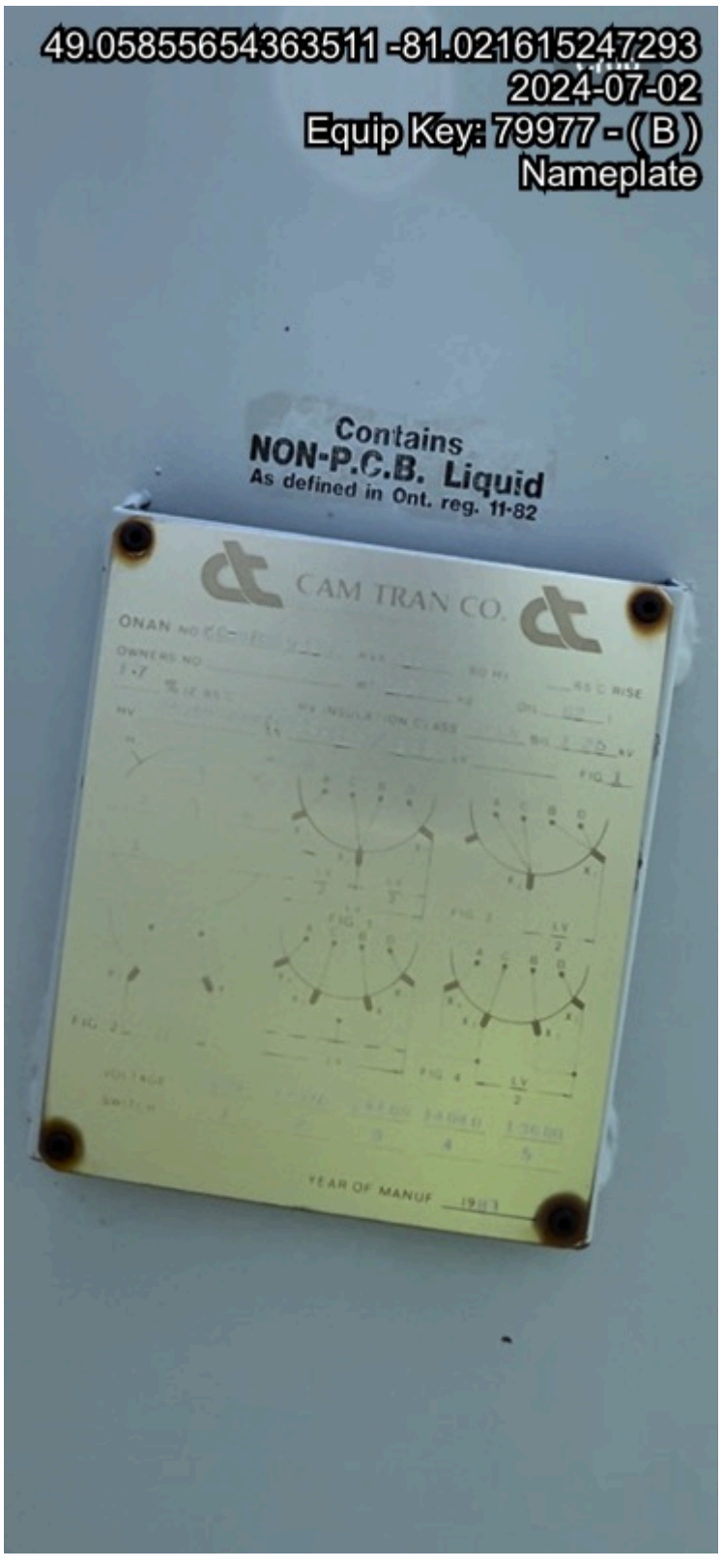
Connections Condition

3

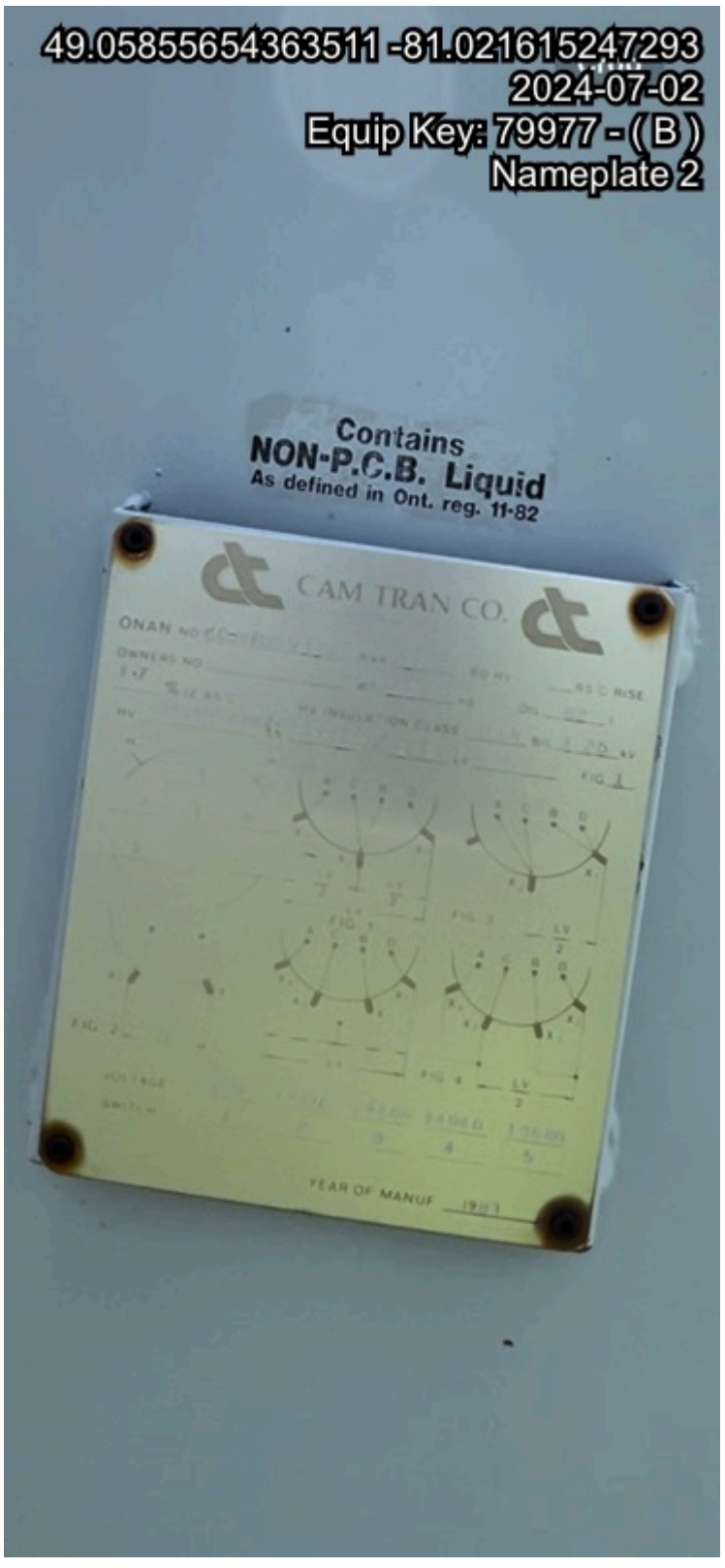
Connections Condition photo


49.05855654363511 -81.021615247293
2024-07-02
79977
Connection Condition - 3

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

1987

Manufacturer

CAM TRAN Co.

Serial # NOT present / legible

NOT LEGIBLE

Equipment Table

To edit data and Barcodes or annotate photos - Click EDIT

EDIT

NOW

79977 - (W)

NOW

79977 - (W)

79977 - (W)

Date Sampled / Visited

07-02-2024

Equipment

3

Hydro One Data Count

3

Equipment on Pole Count

3

Equipment Description

79977 - (W)

Phase Colour Correct (above)

UNKNOWN

Equipment switch photo



Equipment

79977 - (W)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

79977

Equipment Key

79977 - (W)

Current Status

Open

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

0

Bil KV

0

Current Lim Fuse

No

Impedance (Z)

0

Front Pad

Na

Feed Pad

Na

Switch Pad

Na

Weight (kg)

0

Primary Volume 1

Na
Primary Volume 2
Na
Secondary Volume
Na
Dual Volume
Na
Primary Tap Charger
Na
Tap Position
Na
In Service / Out of Service
In Service
Forestry Required
No
Paint - Corrosion
3
Paint - Corrosion photo



Leaking Oil

1

Heating or Discolouration

3

Heating or Discolouration photo



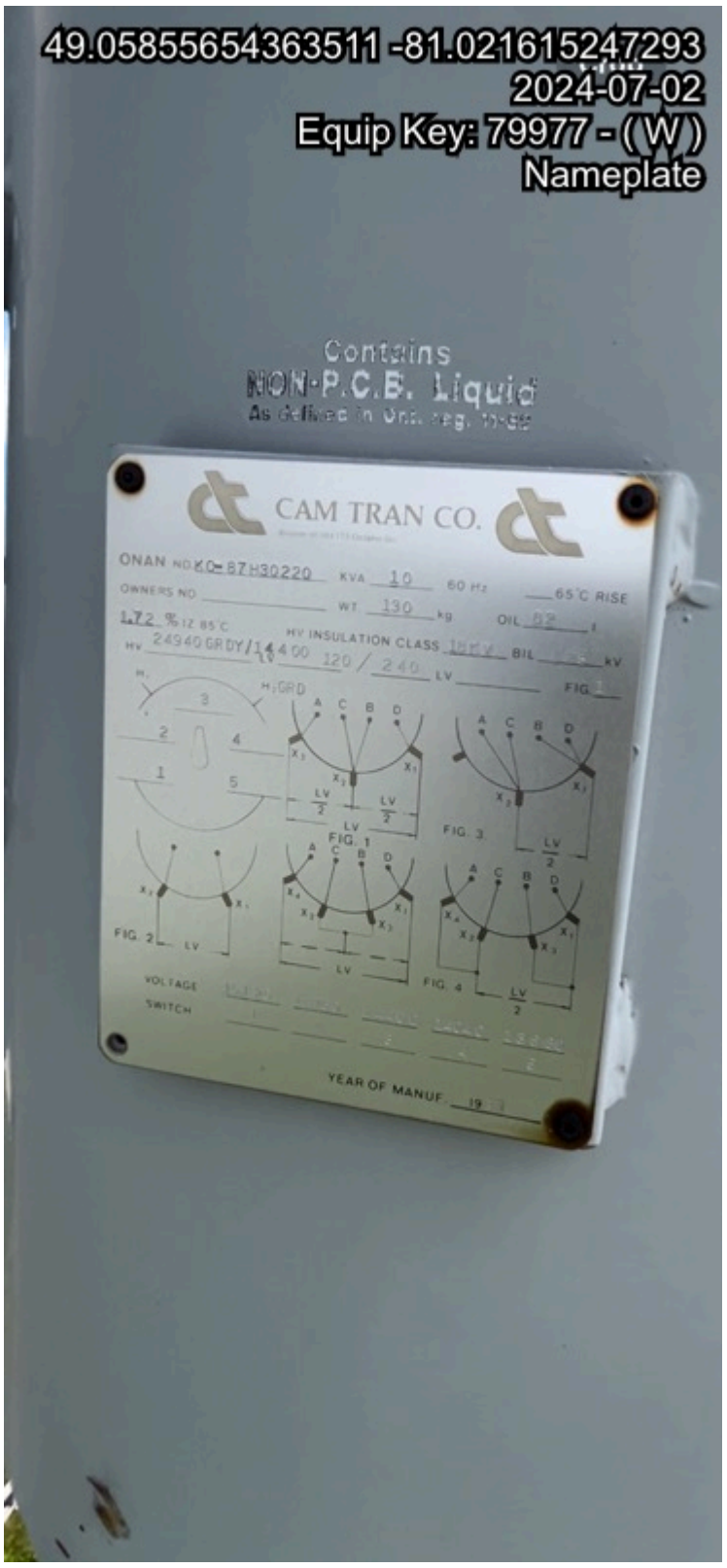
Connections Condition

3

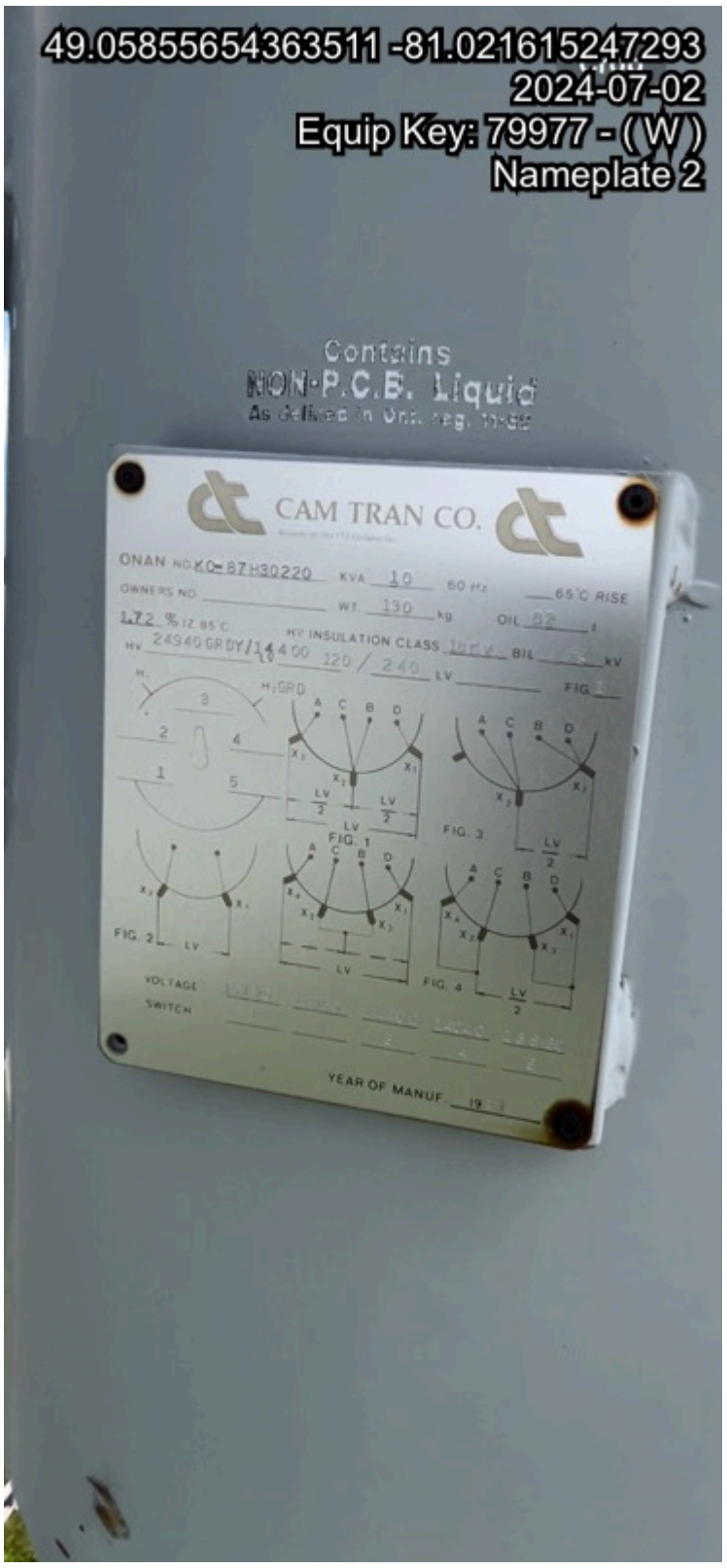
Connections Condition photo


49.05855654363511 -81.021615247293
2024-07-02
79977
Connection Condition - 3

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

1987

Manufacturer

CAM TRAN Co.

Serial #

KC-87H30220

SUBMIT

Was traffic control used to complete this site?

No

Asset Info Matches GIS

N/A

Customer Interaction

No

Did you leave a notice for the customer?

No

NOW - Tx PCB

Completed By	Frodis, Jamie
Completed On	07-02-2024 12:44

INSPECTION / SAMPLING

NOW Sites

80141 - (R)

Date

07-02-2024

Name:

Truck52 Valard

Email:

OntOpTruck52@valard.com

Company / Vendor

Valard

Pole #

80141

Current Status

Open

INSPECTION / SAMPLING

Inspection

Transformer Type in data

POLEMOUNT

Pole / Padmount

POLEMOUNT

Municipality

Cochrane

Feeder #

25kv E

Lat / Long rounded

49.059666 -81.016475

LOCATION INFO

To edit or annotate photos and Barcodes - Click EDIT

EDIT

Pole #

80141

Owner in Customer data

N.O.W

Owner - Accept / Change (above)

ACCEPT

Accessibility - Accept / Change (above)

CHANGE

Update Accessibility

Roadside

Access

3

Access photo



OP DES - Accept / Change (above)

CHANGE

Update OP DES

268

OP DES photo



In there a RED-TAG on the equipment?

No

Electrical Hazard Signs

1

Electrical Hazard Signs photo



From STREET showing Equipment photo



No Barcode on Pole

NO Barcode

Pole Barcode ${9} Enter manually if NOT scanned

No Barcode

Pole Barcode Photo



Equipment Needed for Sampling/Revisit OR Future Work

Squirt bucket - No Mats

FLOC Year NOT on Pole

NO FLOC Year

Pole Label Stamp Year photo



Ground Lead Attachments

3

Ground Lead Attachments photo



Ground Wires & Arrestors

3

Ground Wires & Arrestors photo



Bird or Animal Nests

1

Transformers / Equipment in Customer data

3

Number of Transformers on Pole

3

EQUIPMENT on Pole - Select all that apply

Cutout

Cutout Switch Count

3

TRANSFORMERS / EQUIPMENT

Equipment Table

NOW

80141 - (R)

NOW
80141 - (R)
80141 - (R)
Date Sampled / Visited
07-02-2024
Equipment
1
Hydro One Data Count
3
Equipment on Pole Count
3
Equipment Description
80141 - (R)
Phase Colour Correct (above)
UNKNOWN
Equipment switch photo



Equipment

80141 - (R)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

80141

Equipment Key

80141 - (R)

Current Status

Open

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

0

Bil KV

0

Current Lim Fuse

No

Impedance (Z)

0

Front Pad

Na

Feed Pad

Na

Switch Pad

Na

Weight (kg)

0

Primary Volume 1

Na

Primary Volume 2

Na

Secondary Volume

Na

Dual Volume

Na

Primary Tap Charger

Na

Tap Position

Na

In Service / Out of Service

In Service

Forestry Required

No

Paint - Corrosion

3

Paint - Corrosion photo



Leaking Oil

1

Heating or Discolouration

3

Heating or Discolouration photo



Connections Condition

3

Connections Condition photo


49.05966663573656 -81.01647512500119
2024-07-02
80141
Connection Condition - 3

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

2008

Manufacturer NOT present / legible

NOT LEGIBLE

Serial # NOT present / legible

NOT LEGIBLE

Equipment Table

To edit data and Barcodes or annotate photos - Click EDIT

EDIT

NOW

80141 - (B)

NOW

80141 - (B)

80141 - (B)

Date Sampled / Visited

07-02-2024

Equipment

2

Hydro One Data Count

3

Equipment on Pole Count

3

Equipment Description

80141 - (B)

Phase Colour Correct (above)

UNKNOWN

Equipment switch photo



Equipment

80141 - (B)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

80141

Equipment Key

80141 - (B)

Current Status

Open

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

0

Bil KV

0

Current Lim Fuse

No

Impedance (Z)

0

Front Pad

Na

Feed Pad

Na

Switch Pad

Na

Weight (kg)

0

Primary Volume 1

Na

Primary Volume 2

Na

Secondary Volume

Na

Dual Volume

Na

Primary Tap Charger

Na

Tap Position

Na

In Service / Out of Service

In Service

Forestry Required

No

Paint - Corrosion

3

Paint - Corrosion photo



Leaking Oil

1

Heating or Discolouration

3

Heating or Discolouration photo



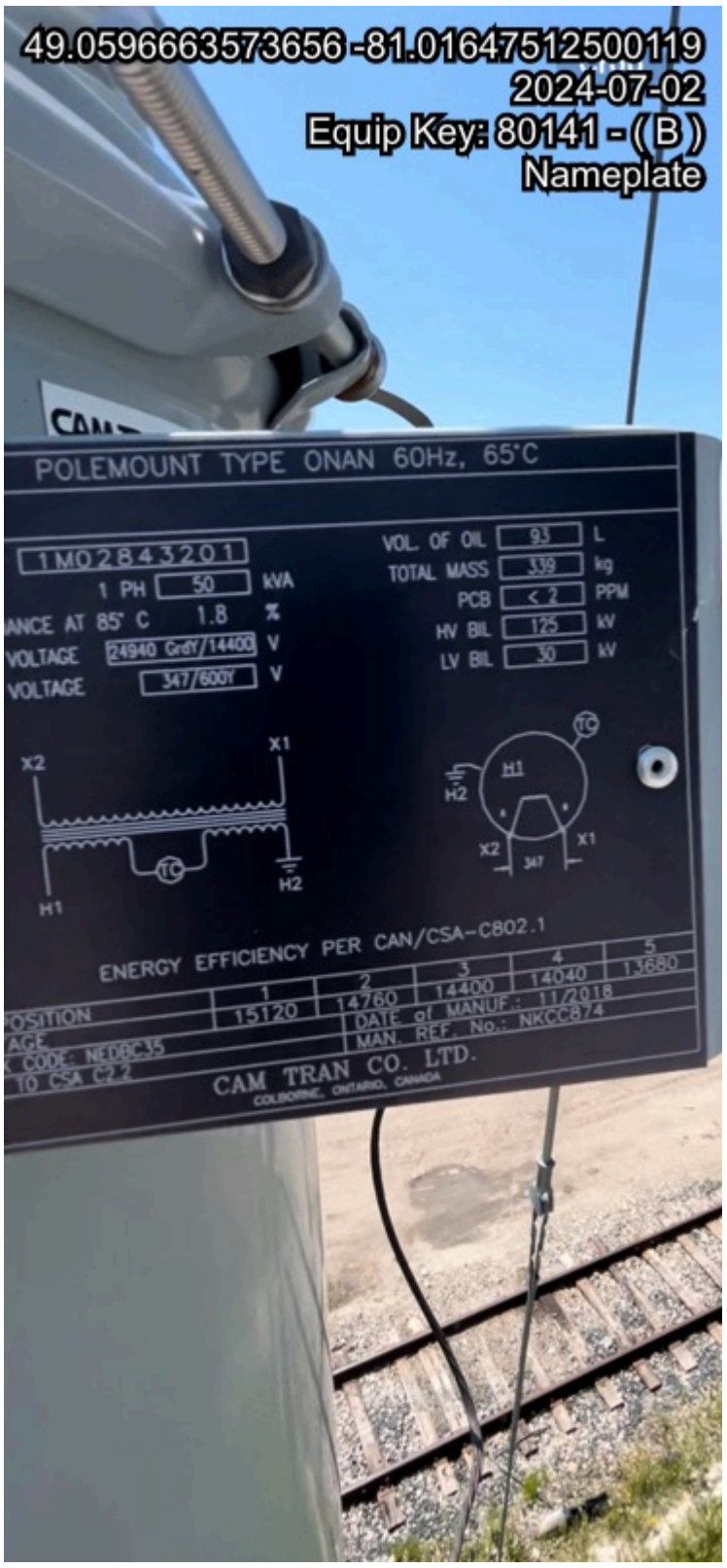
Connections Condition

3

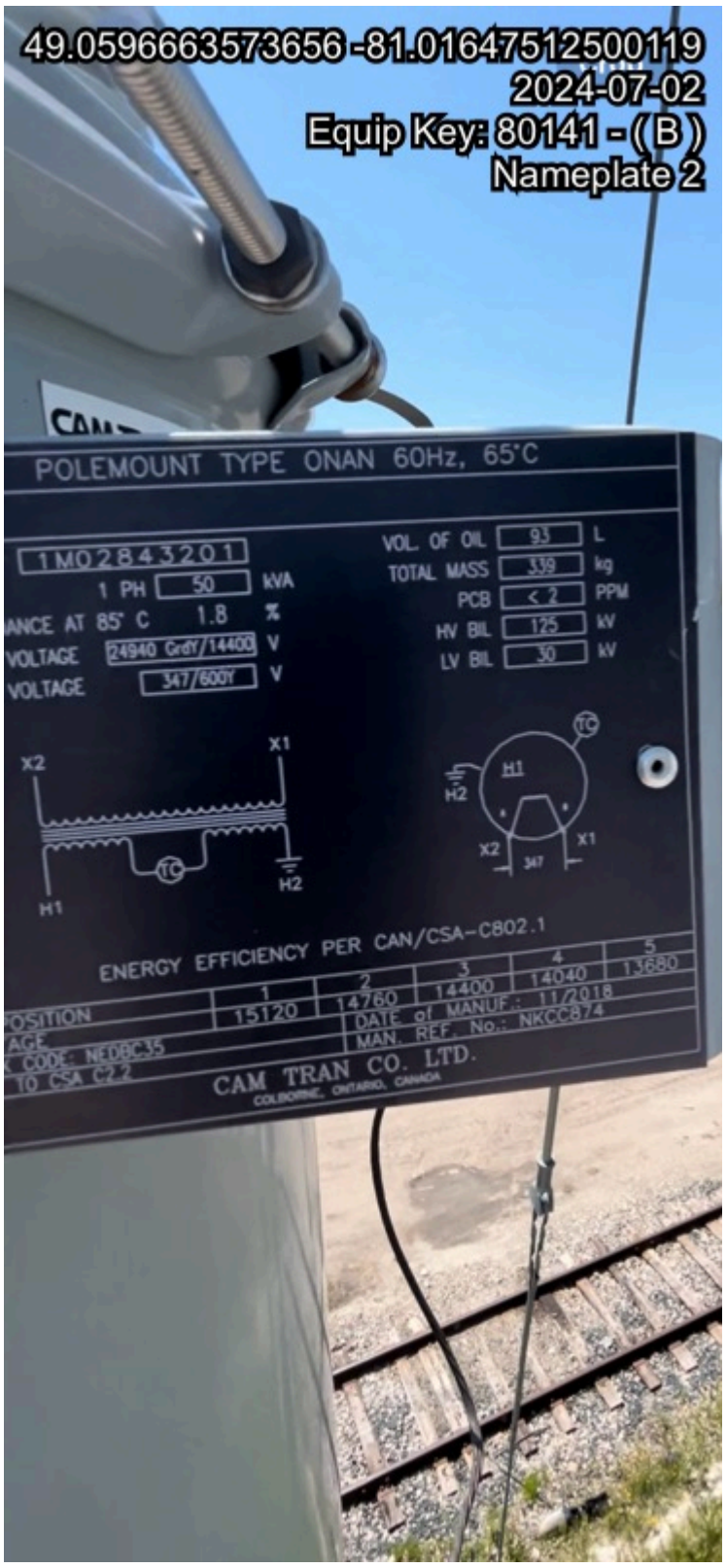
Connections Condition photo


49.05966663573656 -81.01647512500119
2024-07-02
80141
Connection Condition - 3

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

2018

Manufacturer

CAM TRAN Co.

Serial #

1m02843201

Equipment Table

To edit data and Barcodes or annotate photos - Click EDIT

EDIT

NOW

80141 - (W)

NOW

80141 - (W)

80141 - (W)

Date Sampled / Visited

07-02-2024

Equipment

3

Hydro One Data Count

3

Equipment on Pole Count

3

Equipment Description

80141 - (W)

Phase Colour Correct (above)

UNKNOWN

Equipment switch photo



Equipment

80141 - (W)

H1 Equipment Type - Pole / Pad / Other Equipment

POLEMOUNT

Equipment Type Correct (above)

ACCEPT

Equipment Selected

Transformer

Original Action

Tx - Inspection

Function Location

80141

Equipment Key

80141 - (W)

Current Status

Open

Status Update

300 Does not need a sample: 1981 or newer

Rated KVA

0

Bil KV

0

Current Lim Fuse

No

Impedance (Z)

0

Front Pad

Na

Feed Pad

Na

Switch Pad

Na

Weight (kg)

0

Primary Volume 1

Na

Primary Volume 2

Na

Secondary Volume

Na

Dual Volume

Na

Primary Tap Charger

Na

Tap Position

Na

In Service / Out of Service

In Service

Forestry Required

No

Paint - Corrosion

3

Paint - Corrosion photo



Leaking Oil

1

Heating or Discolouration

3

Heating or Discolouration photo



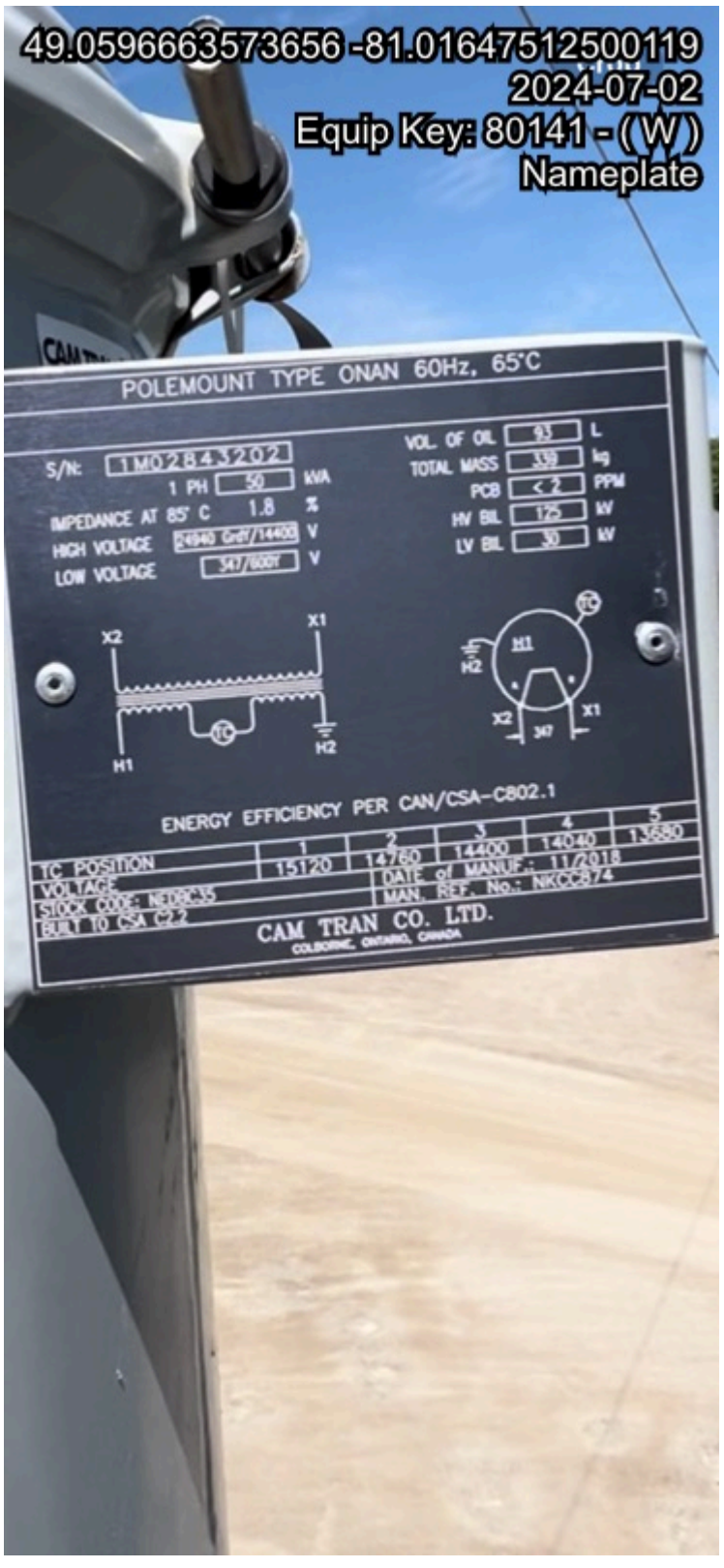
Connections Condition

3

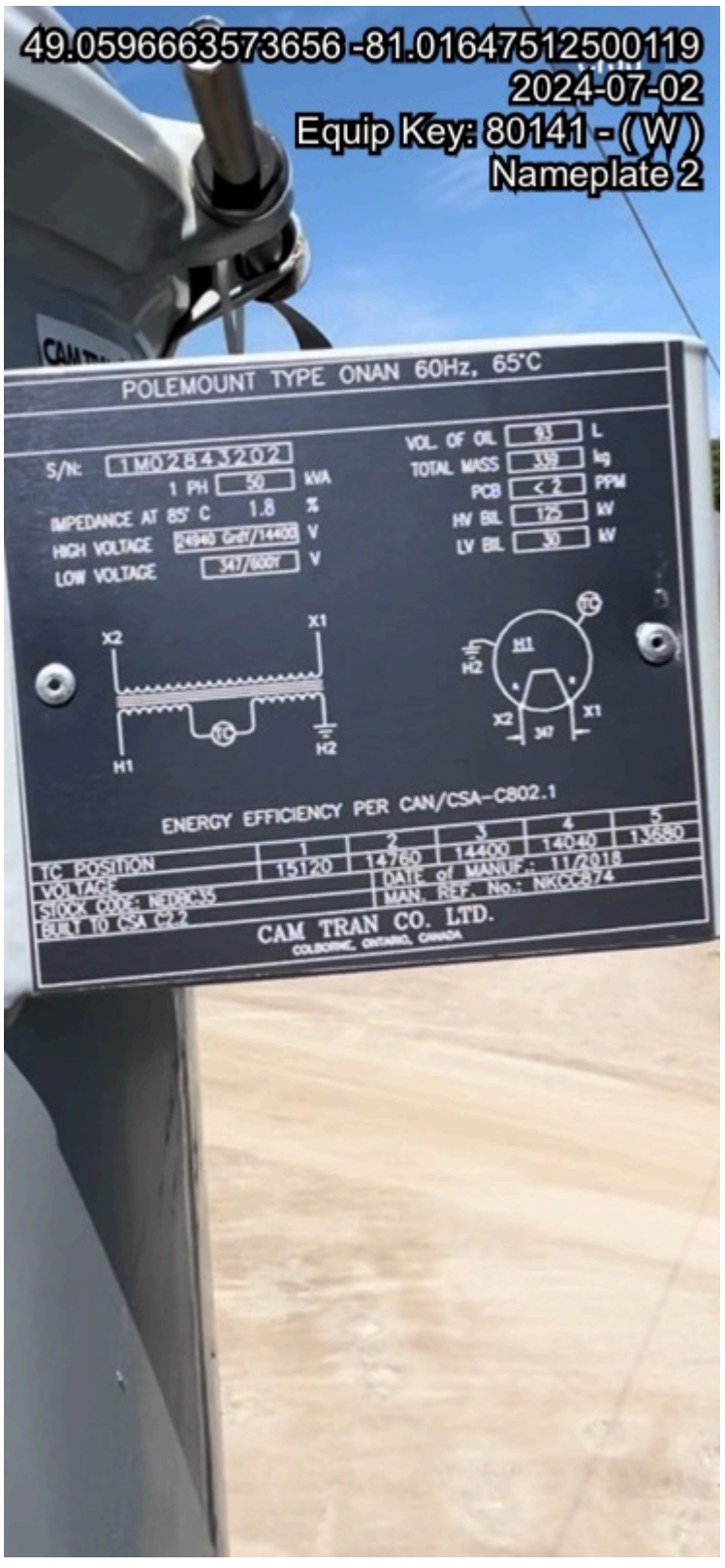
Connections Condition photo


49.05966663573656 -81.01647512500119
2024-07-02
80141
Connection Condition - 3

Name Plate



2nd Name Plate - DIFFERENT ANGLE



Year:

2018

Manufacturer

CAM TRAN Co.

Serial #

1m02843202

SUBMIT

Was traffic control used to complete this site?

No

Asset Info Matches GIS

N/A

Customer Interaction

No

Did you leave a notice for the customer?

No

Ready to Submit INSPECTION

COMPLETED

REVIEW

Date

07-02-2024

Inspection

ACCEPT

General and Oil Sample Comments Combined

#1 - 80141 - (R)
Original: 80141 - (R)
Current: POLEMOUNT
 STATUS: 300 Does not need a sample: 1981 or newer

 #2 - 80141 - (B)
Original: 80141 - (B)
Current: POLEMOUNT
 STATUS: 300 Does not need a sample: 1981 or newer

 #3 - 80141 - (W)
Original: 80141 - (W)
Current: POLEMOUNT
 STATUS: 300 Does not need a sample: 1981 or newer

BACK STEP / CLOSE

Ready to Submit INSPECTION

COMPLETED

REVIEW

Date

07-02-2024

Inspection

ACCEPT

General and Oil Sample Comments Combined

#1 - 79977 - (R)
Original: 79977 - (R)
Current: POLEMOUNT
 STATUS: 300 Does not need a sample: 1981 or newer

 #2 - 79977 - (B)
Original: 79977 - (B)
Current: POLEMOUNT
 STATUS: 300 Does not need a sample: 1981 or newer

 #3 - 79977 - (W)
Original: 79977 - (W)
Current: POLEMOUNT
 STATUS: 300 Does not need a sample: 1981 or newer

BACK STEP / CLOSE

7 References

[1] “CSA Z462-24: Canadian Standards Association - Workplace Electrical Safety Standard,” *CSA Group*.

[2] “Ontario Electrical Safety Code (OESC) - 2021,” *Ontario Ministry of Labour, Training and Skills Development*.

[3] “ANSI C37.13-1981: IEEE Standard for Low-Voltage AC Power Circuit Breakers Used in Enclosures,” *ANSI*.

[4] “ANSI C37.010-1979: IEEE Standard for Application of Low-Voltage Circuit Breakers,” *ANSI*.

[5] “ANSI C37.5-1979: IEEE Standard for Low-Voltage Power Circuit Breakers,” *ANSI*.

[6] “IEEE Standard 141: Recommended Practice for Electric Power Distribution for Industrial Plants,” *IEEE*.

[7] “IEEE 1584-2018: Guide for Performing Arc-Flash Hazard Calculations,” *IEEE*.

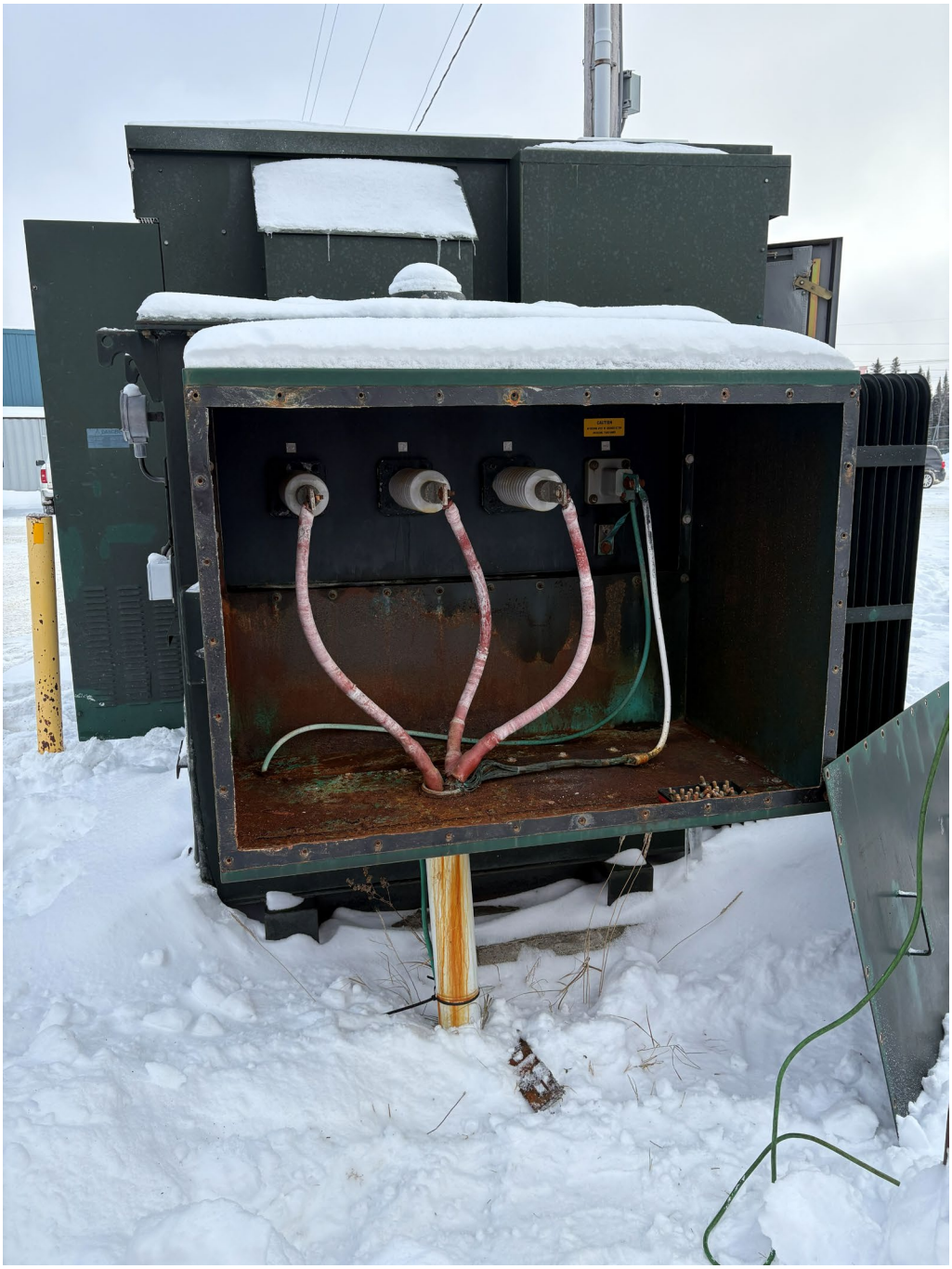
8 Revisions

Table 8.1: Revisions

Revision Number	Date	Author	Summarized Comments
0	December 31st, 2025	KC	Initial Release

APPENDIX J - PHOTOGRAPHS

Refer to the photographs below.




SIEMENS



APPENDIX K - POLICIES AND PROCEDURES

The Successful Proponent will be required to adhere to the Policies and Procedures as outlined below, and which will be provided at project kick-off.

TITLE	DATE
ONTC Electrical Safety Policy	April 6, 2023
ONTC Lockout Tag out Procedure	February 9, 2017
ONTC Blue Signals / Flags Procedure	February 7, 2014
ONTC Contractor / Subcontractor Policy	September 17, 2024
Contractors Working on ONTC Property Near Railway Tracks	April 30, 2025