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 \*\* Also of the Washington Bar

December 18, 2020

## VIA ELECTRONIC MAIL

British Columbia Utilities Commission  
 6<sup>th</sup> Floor, 900 Howe Street  
 Vancouver, B.C.  
 V6Z 2N3

**Attention: Marija Tresoglavic, Acting Commission Secretary**

Dear Sirs/Mesdames:

**Re: City of Grand Forks Electric Utility Application to the British Columbia Utilities Commission for Approval of a Bypass Agreement with FortisBC Electric Inc. (“FBC”) (the “Application”)**

We are counsel to the City of Grand Forks Electric Utility (“**Grand Forks**”) which is an electric utility servicing the municipality of Grand Forks which is owned and operated by the City of Grand Forks. Grand Forks is also a wholesale customer of FBC. We have been retained by Grand Forks to file the above described Application and on behalf of Grand Forks request that the Commission accept this letter and attachments as the Application.

Grand Forks has consulted with FBC in preparing this Application and FBC has provided a letter of comment which is attached as Schedule “A”. FBC has also agreed as to the form of Bypass Agreement and Wholesale Power Agreement with Grand Forks which are attached as Schedules “B” and “C” to this letter Application.

Over the past three years Grand Forks has undertaken an extensive analysis of its cost of electricity and has determined through this analysis that it can lower its cost of electricity by constructing and operating a substation that would bypass FBC’s distribution system. Grand Forks also assessed with FBC pursuing a bypass rate and concluded it is the preferred option. This letter and the attached material should be taken for an Application for an order from the Commission pursuant to sections 60 and 61 of the *Utilities Commission Act* for approval for the Bypass Agreement proposed.

The Order sought is consistent with the Commission’s Bypass Rate Guidelines and is generally consistent with the form of letter approval issued by the Commission in Letter L-1-10-03 approving in principle a Bypass Agreement between Pope and Talbot and Aquila Networks

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Our File: 30987/0003

Canada, a predecessor utility to FBC serving the same service territory, a copy of which letter and ultimate bypass agreement in relation to that direction are attached for ease of reference as Schedule "D" to this letter Application.

## **BACKGROUND**

The City of Grand Forks, with a population of approximately 4,000 people, is one of the unique municipalities in British Columbia which own and operate its own electrical distribution utility and as such is regulated by its municipal council.

As noted, Grand Forks is served as a FBC wholesale customer. To date, this has been under electric tariff schedule 40-Wholesale-Service-Primary.

As part of this Application process, Grand Forks has negotiated renewal of its Wholesale Power Agreement with FBC and the agreed upon and executed in November of 2020 is attached as Schedule "C" to this letter Application.

In the FBC's 2017 Rate Design Application ("**2017 RDA**"), FBC proposed a transmission discount to Rate Schedule 40. The inclusion of the transmission discount was consistent with a similar provision found in both Rate Schedule 21 and Rate Schedule 30 which allows that a customer that does not meet the eligibility criteria for the Rate Schedule offering service of a higher voltage, to receive a lower rate based on providing their own transformation.

FBC noted in their 2017 RDA that during the consultation that proceeded the 2017 RDA FBC received correspondence from Grand Forks indicating it was considering a change to the voltage at which it takes service from FBC. The addition of a transmission discount was intended to facilitate this change without the need for further regulatory process outside of the 2017 RDA, and that, if approved by the Commission, the discount would then be available for any FBC wholesale customer, assuming eligibility.

In the Commission's decision on the FBC 2017 RDA the Panel stated at page 76 of 100:

"The Panel approves the addition of a transformation discount for RS 40 Customers that take delivery at Transmission voltage. The Panel agrees that approval of this discount will facilitate the change being considered by Grand Forks and the discount would then be available for other wholesale customers in the future."

## **THE BYPASS PROPOSAL**

Given the availability of the revised transmission rate, Grand Forks has determined after careful and lengthy deliberation, and through consultation and negotiation with FBC, it is equally economic to pursue a Bypass Application as a viable and appropriate alternative to Grand Forks building its own substation in order to access the transmission rate and available discount.

Grand Forks commenced this process with an application to FBC in March of 2018, requesting a change from distribution billing to transmission billing. Grand Forks indicated that it was prepared to move ahead with building a substation and receive service from FBC at 60 kV, however, after discussions with FBC, it was determined that an economic bypass arrangement make more sense as it would reduce the amount of infrastructure built in Grand Forks and would keep Grand Forks financially whole in comparison to building its own substation. Further, the analysis was FBC ratepayers would not be adversely impacted by an appropriate and fair bypass arrangement consistent with Commission guidelines.

Grand Forks calculated its costs of building and owning a substation and determined that if financed over 20 years or more building a substation becomes a self-funding project. Grand Forks therefore proposed that an economic bypass be based on the expected 50 year life of a substation and a 20 year financing.

### **THE COMMISSION HAS PREVIOUSLY SET BYPASS RATE GUIDELINES**

In Decision G-88-99 dated December 3, 1999, the Commission set Bypass Rate Guidelines. The Decision states that a customer utility may apply for a bypass rate if a customer with a viable option to construct a substation for the purpose of moving from distribution rate schedule to transmission rate schedule can be effectively persuaded to abandon the plan, as long as the utility can make an offer for a bypass rate that is at or lower than the cost to the customer to construct their own facility. The bypass rate would consist of the lower transmission rate, plus a rider to be equal to the cost to the customer of constructing their own bypass facility.

### **PARAMETERS OF THE BYPASS PROPOSAL**

The proposed Bypass Agreement which form has been settled between FBC and Grand Forks is attached as Schedule “B” to this Application. The negotiating points for the agreement arise from engineering and cost calculations prepared for Grand Forks in August 2017, attached as Schedule “D” to this letter Application. The financial parameters were subsequently updated by Grand Forks in September 2020, and are attached as Schedule “E”. The parameters of the Bypass Agreement negotiation generally were as follows:

1. Grand Forks circulating copies of its preliminary station layout and protective scheme to FBC;
2. Grand Forks identified three locations for a station and determined that one of them was not available but the other two are. The higher cost of the remaining two was used in cost estimating;
3. Grand Forks completed a detailed cost estimate for building a station complete with budgetary quotations. Two construction options were considered and the higher cost option has been used in cost estimating;

4. Grand Forks had the experience of Nelson Hydro consulting to them. Nelson Hydro has experience in constructing and operating substations;
5. Construction of a substation was approved by Grand Forks council in its 5 year financial plan and remains in the Grand Forks capital plan; and
6. Grand Forks can borrow from the Municipal Finance Authority at 2.38% to fund construction of the substation.

The proposal is that the Bypass Agreement would:

1. Have a 50 year term;
2. Grand Forks would become a transmission customer for all energy flowing through the Ruckels Substation under the new transmission discount and Rate Schedule 40;
3. Grand Forks will pay to FBC the equivalent cost of building and operating a substation being in two components (defined terms below are as defined in the Bypass Agreement):
  - a. A Bypass Rate Rider of \$21,695 per month for the entirety of the Initial Term, effective as of the Effective Date to represent Grand Forks financing cost for building the substation;
  - b. An Operations and Maintenance Rider (“**O&M Rider**”) of \$2,352.75 per month for as long as the Bypass Agreement is in effect, effective as of the Effective Date. The O&M Rider shall, each year on December 31, be escalated based on annual change in the British Columbia All Items Consumer Price Index for the 12 month period from October 31 to October 31 of the previous year; and
  - c. At the end of the 50 years Grand Forks will either revert to being a distribution customer or remain a transmission customer by entering into a new economic bypass agreement with FBC or by building its own substation.

Those parameters have been incorporate into the draft Bypass Agreement which has been settled by FBC and Grand Forks. Both parties have recognized and negotiated to recognize the need to protect the interests of other ratepayers of FBC.

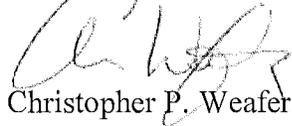
Grand Forks submits it has provided the necessary information to the Commission to approve the proposed Bypass Agreement and Grand Forks looks forward to providing any information required by the Commission to review the Application.

Again to highlight, attached in support of the Application by Grand Forks are the following:

1. FBC's Letter of comment on the Application, Schedule "A";
2. The form of Bypass Agreement settled by Grand Forks and FBC, Schedule "B";
3. The signed Wholesale Power Agreement executed by Grand Forks and FBC in November 2020, Schedule "C";
4. A copy of the Commission Letter Decision L-1-10-03 approving in principle a Bypass Rate Application in the FBC service territory in 2003, Schedule "D"
5. Original Engineering and Cost estimates for the Grand Forks Substation from August 2017, Schedule "E"; and
6. Updated costs estimates for the Grand Forks Substation prepared in September 2020, Schedule "F".

Yours truly,

**OWEN BIRD LAW CORPORATION**



Christopher P. Weafer

CPW/jj

cc: Alex Love, Consultant to Grand Forks  
cc: Daniel Drexler, City of Grand Forks  
cc: Corey Sinclair, FortisBC Electric Inc.

# **SCHEDULE "A"**

FBC's Letter of comment on the Application dated November 26, 2020



**FORTIS BC™**

**Diane Roy**  
Vice President, Regulatory Affairs

**Gas Regulatory Affairs Correspondence**  
Email: [gas.regulatory.affairs@fortisbc.com](mailto:gas.regulatory.affairs@fortisbc.com)

**Electric Regulatory Affairs Correspondence**  
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[www.fortisbc.com](http://www.fortisbc.com)

November 26, 2020

British Columbia Utilities Commission  
Suite 410, 900 Howe Street  
Vancouver, BC  
V6Z 2N3

Attention: Ms. Marija Tresoglavic, Acting Commission Secretary

Dear Ms. Tresoglavic:

**Re: City of Grand Forks Electric Utility Application for Approval of a Bypass Agreement with FortisBC Inc. (Application)**  
**FortisBC Inc. Submission**

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FortisBC Inc. (FBC or the Company) provides the following as an initial submission in the above noted matter.

FBC considers that the Application put forward by the City of Grand Forks Electric Utility (the City) is consistent with the intent and process of the British Columbia Utilities Commission (BCUC) Bypass Guidelines<sup>1</sup>. FBC has been aware of the intention of the City to explore options to bypass the FBC distribution system since 2017, and the matter was raised during the Company's 2017 Cost of Service and Rate Design Application. Part of the rationale for applying for a transformation discount to be added to Rate Schedule 40 (Primary Wholesale Service) was the possibility that the City would proceed with the construction of bypass facilities.

FBC has reviewed the technical and financial aspects of the City's physical bypass facility and considers it to be viable and credible. If the physical bypass facility were constructed, the Company would connect such a bypass facility to the FBC system for supply at 60 kV, under Rate Schedule 40, eligible for the transformation discount, provided the City pays all costs of interconnection, including the cost of new metering, and signs a new Wholesale Service Agreement.

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<sup>1</sup> Attachment A to BCUC Decision G-88-99.

FBC agrees with the City that, through the construction of a substation to bypass the Company's distribution system, and the resulting rate discount, the City would reduce its overall annual electricity costs. The construction of the substation would also mean that the quality of the power supply would be reduced as compared to the status quo. As noted at page 3 of the Andreychuk – Burns report included as part of Appendix C to the Application<sup>2</sup>, the redundancy of the power supply provided by FBC does not exist within the City's bypass plan. In the event of a failure within the City's bypass facility, FBC would not be obligated to supply back up, but would do so on commercial terms only on an "as is where is" basis. The possibility exists that due to the lead times involved, City customers could experience an outage for an extended period.

FBC understands that, through the current Application, and in accordance with the BCUC's Bypass Rate Guidelines, the City is applying for approval for a Bypass rate as an alternative to actually constructing the proposed bypass facilities. The Bypass Rate Guidelines contemplate that where the BCUC finds the bypass proposal to be viable and credible, and where the Customer's Cost of Bypass<sup>3</sup> exceeds the utility's Incremental Cost of Service, the customer should be offered the opportunity to switch from the applicable distribution service rate to the applicable transmission service rate<sup>4</sup> upon payment of an amount equal to the Customer's Cost of Bypass in the form of a rider payment added to the transmission rate.

FBC has considered the matter of the incremental cost to serve the City both with and without the City's bypass facility and has determined that while there may be some costs associated with the removal of the existing distribution service that would be required if the bypass facility was constructed, there is no appreciable cost difference to FBC related to ongoing service to the City at transmission voltage. That is, the bypass would result in no change to the City load and the transmission system at the point of interconnection will require no reinforcements in order to accommodate the proposed facilities. Therefore, FBC has concluded that the City's Cost of Bypass exceeds FBC's Incremental Cost of Service.

If the BCUC approves the City's Application and based on the information provided by the City, FBC has calculated that the annual net savings to the City, based on actual 2019 load at current rates, inclusive of the Cost of Bypass and Operation and Maintenance allowance would be approximately \$210 thousand.<sup>5</sup>

FBC has negotiated a new Wholesale Service Agreement and a Bypass Rate Agreement with the City which are intended to minimize the impact to other FBC customers to the extent possible. These agreements form part of the City's Application.

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<sup>2</sup> "Prospective 15MVA-63/12.4KV Substation Build City of Grand Forks Utility Grand Forks BC Canada" – May 2017.

<sup>3</sup> The Cost of Bypass has been calculated by the City as \$ 4,104,805 as set out in the Application.

<sup>4</sup> In this case, Grand Forks would remain on Rate Schedule 40 – Wholesale Service Primary, but would be eligible for the Transmission Discount.

<sup>5</sup> Based on actual 2019 load at current 2020 rates. The amount represents the difference between the load billed with and without the RS40 transformation discount, less the Bypass and O&M payment. It is an approximation of the amount to be saved by the City on an annual basis, subject to the annual escalation and any annual changes in the RS40 rate.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

***Original signed:***

Diane Roy

# **SCHEDULE "B"**

Draft Form of Bypass Agreement

**BYPASS RATE AGREEMENT**

**EFFECTIVE AS OF \_\_\_\_\_**

Between:

**CITY OF GRAND FORKS**

- and -

**FORTISBC INC.**

**FORTISBC INC.  
1975 SPRINGFIELD ROAD  
KELOWNA, BC  
V1Y 7V7**

**BYPASS RATE AGREEMENT** (this “**Agreement**”) entered into by the parties on the \_\_\_ day of \_\_\_\_\_, 20\_\_ (the “**Effective Date**”).

This Agreement is made between FORTISBC INC. (“**FBC**”), with a head office located at 1975 Springfield Rd., Kelowna, British Columbia, V1Y 7V7 and the City of Grand Forks (the “**Customer**”), located at 7217 4<sup>th</sup> Street, Grand Forks, British Columbia, V0H 1H0, each a “**Party**” and together the “**Parties**”.

**WHEREAS** FBC and the Customer entered into a Wholesale Power Agreement dated \_\_\_\_\_, (the “**Wholesale Agreement**”) pursuant to which FBC agreed to supply and the Customer agreed to purchase electric service for use in the Customer’s Electrical Boundary (as defined in the Wholesale Agreement) in and around the Town of Grand Forks, in the Province of British Columbia;

**AND WHEREAS** subsequent to a Bypass Rate Application by the Customer, the British Columbia Utilities Commission (“**BCUC**”) recommended by Letter No. \_\_\_\_\_ dated \_\_\_\_\_, that FBC and the Customer negotiate a bypass rate (the “**Bypass Rate**”) to reflect the bypass arrangement between the parties;

**AND WHEREAS** FBC and the Customer have reached an agreement in their negotiation of a Bypass Rate, the details of which are specified herein;

**NOW THIS AGREEMENT WITNESSES** that in consideration of the mutual agreements and covenants contained herein and for other good and valuable consideration (the receipt and adequacy of which are hereby acknowledged by each of the parties hereto), the parties hereto agree as follows.

**PROVISION OF ELECTRIC SERVICE:**

1. FBC agrees to provide electric service to the Customer and the Customer accepts such electric service and agrees to pay all charges specified in this Agreement, all upon and subject to the terms and conditions of this Agreement. Furthermore, the Customer acknowledges and agrees that the terms, conditions and schedules of the FBC Electric Tariff B.C.U.C. No. 2, as filed with, approved, amended and revised by the British Columbia Utilities Commission from time to time shall form part of this Agreement (the “**Terms and Conditions**”). If there is any conflict or inconsistency raised between the Terms and Conditions and the terms of this Agreement, then this Agreement shall take precedence.

**TERM AND TERMINATION:**

2. This Agreement shall have a term of two hundred forty (240) months or twenty (20) years from the Effective Date (the “**Initial Term**”), unless terminated earlier by the Customer on the conditions specified herein.
3. One year prior to the expiry of the Initial Term, if either Party believes that there’s been a change to a condition upon which the Parties entered into this Agreement, that was not contemplated in the Bypass Rate Application and this Agreement, that Party will notify, in writing, the other Party by providing details of the change. If the Parties are able to negotiate

a resolution to address the change, then the Parties will renew this Agreement for an additional ten year period and file any amendment(s) to this Agreement with the BCUC for their approval. If the Parties are unable to negotiate a resolution to address the change, six months prior to the expiry of the Initial Term, the Party that provided the initial notification may file an application to the BCUC to amend or terminate this Agreement. If the BCUC determines that the Agreement shall be renewed, including any amendments thereto, or if neither Party has provided notice as contemplated in this clause, this Agreement shall renew for an additional ten (10) year period (the "First Renewal Term"). If the BCUC no longer approves of the terms and conditions of this Agreement and it does not renew, the Parties agree that the terms and conditions of the Wholesale Agreement shall apply until such time as the Parties are able to agree on the terms of a new Bypass Agreement, if applicable.

4. One year prior to the expiry of the First Renewal Term, if either Party believes that there's been a change to a condition upon which the Parties entered into this Agreement that was not contemplated in the Bypass Rate Application and this Agreement, that Party will notify, in writing, the other Party by providing details of the change. If the Parties are able to negotiate a resolution to address the change, then the Parties will renew this Agreement for an additional ten year period and file any amendments to this Agreement with the BCUC for their approval. If the Parties are unable to negotiate a resolution to address the change, six (6) months prior to the expiry of the First Renewal Term, the Party that provided the initial notification may file an application to the BCUC to amend or terminate this Agreement. If the BCUC determines that the Agreement shall be renewed, including any amendments thereto, or if neither Party has provided notice as contemplated in this clause, this Agreement shall renew for an additional ten (10) year period (the "Second Renewal Term"). If the BCUC no longer approves of the terms and conditions of this Agreement, and it does not renew, the Parties agree that the terms and conditions of the Wholesale Agreement shall apply until such time as the Parties are able to agree on the terms of a new Bypass Agreement, if applicable.
5. One year prior to the expiry of the Second Renewal Term, if either Party believes that there's been a change to a condition upon which the Parties entered into this Agreement that was not contemplated in the Bypass Rate Application and this Agreement, that Party will notify, in writing, the other Party by providing details of the change. If the Parties are able to negotiate a resolution to address the change, then the Parties will renew this Agreement for an additional ten year period and file any amendments to this Agreement with the BCUC for their approval. If the Parties are unable to negotiate a resolution to address the change, six months prior to the expiry of the Second Renewal Term, the Party that provided the initial notification may file an application to the BCUC to amend or terminate this Agreement. If the BCUC determines that the Agreement shall be renewed, including any amendments thereto, or if neither Party has provided notice as contemplated in this clause, this Agreement shall renew for an additional ten (10) year period (the "Third Renewal Term"). If the BCUC no longer approves of the terms and conditions of this Agreement, and it does not renew, the Parties agree that the terms and conditions of the Wholesale Agreement shall apply until such time as the Parties are able to agree on the terms of a new Bypass Agreement, if applicable.

6. The Customer may terminate this Agreement during the Initial Term, the First Renewal Term, the Second Renewal Term or the Third Renewal Term by giving written notice to FBC, twelve (12) months prior to the expiry of the Initial Term, the First Renewal Term, the Second Renewal Term or the Third Renewal Term, that this Agreement shall terminate. Such notice to terminate shall be given in such manner that the Agreement terminates with the last day of a billing period. FBC may suspend or terminate Service, during the Initial Term or any Renewal Term, as per the Terms and Conditions.

#### **RATES AND CHARGES:**

7. The Customer agrees to pay on the terms described therein the relevant charges referenced in the Terms and Conditions as may be modified from time to time, which include, without limitation:
  - (a) Payments under Rate Schedule 40, as approved or revised by the BCUC from time to time. As long as this Agreement or any extension to this Agreement remains in effect, the Customer shall be eligible for the Delivery Voltage Discount as described in Rate Schedule 40;
  - (b) A Bypass Rate Rider of \$21,695 per month for the entirety of the Initial Term, effective as of the Effective Date (the “**Bypass Rate Rider**”); and
  - (c) An Operations and Maintenance Rider (the “**O&M Rider**”) of \$2352.75 per month for as long as this Agreement or any extension to this Agreement is in effect, effective as of the Effective Date. The O&M Rider shall, each year on December 31, be escalated based on annual change in the British Columbia All Items Consumer Price Index for the 12 month period from October 31 to October 31 of the preceding year.
8. Any modification of the Bypass Rate Rider or the O&M Rider during the term of this Agreement shall be subject to BCUC approval.
9. The Contract Demand can be reduced or increased in accordance with the Terms and Conditions and the terms of this Agreement.

#### **METERING OF POWER AND ENERGY:**

10. Electric service supplied to the Customer by FBC will be metered by metering equipment owned and maintained by FBC which will be installed at the Point of Delivery or at such other point as otherwise mutually agreed.

#### **THE CUSTOMER'S TECHNICAL OBLIGATIONS:**

11. The Customer will own, construct, maintain and operate the equipment necessary to accept electric service from FBC from the Point of Delivery, with the exception of any equipment installed by FBC or any other person, for and on behalf of FBC, including any necessary metering equipment.

**ADDITIONAL CONTRACT TERMS:**

12. This Agreement is subject to the Customer obtaining approval from the BCUC. If the Customer is unable to obtain approval of this Agreement from the BCUC, this Agreement is null and void.
13. This Agreement may not be assigned by the Customer without the prior written consent of FBC, which consent shall not be unreasonably withheld.
14. All defined terms not defined herein shall have the meanings assigned to them in the Terms and Conditions.
15. No amendment to this Agreement will be valid or binding unless set forth in writing and duly executed by both of the parties hereto. No waiver of any breach of any term or provision of this Agreement will be effective or binding unless made in writing and signed by the party purporting to give the same and, unless otherwise provided in the written waiver, will be limited to the specific breach waived.
16. The division of this Agreement into Sections and the insertion of headings are for convenience only and will not affect the construction or interpretation of this Agreement.
17. Any demand, notice or other communication (“**Notice**”) required or permitted to be given in connection with this Agreement shall be given in writing and must be given by personal delivery, registered mail or facsimile transmittal as follows:

- (a) Notice to FBC shall be addressed to:

FORTISBC INC.  
1975 Springfield Rd  
Kelowna, British Columbia, V1Y 7V7  
Attention: Manager, Regulatory Affairs  
Email: [electricity.regulatory.affairs@fortisbc.com](mailto:electricity.regulatory.affairs@fortisbc.com)

- (b) Notice to the Customer shall be addressed to:

The Corporation of the City of Grand Forks  
7217 4<sup>th</sup> Street  
Grand Forks, British Columbia, V0H 1H0  
Attention: Chief Administrative Officer  
with a copy to: Manager of Operations  
Email: [info@grandforks.ca](mailto:info@grandforks.ca)

or to such other address, facsimile number or individual as may be agreed between the parties in writing. Any Notice given by personal delivery shall be conclusively deemed to have been given on the day of actual delivery thereof and, if given by registered mail, five (5) business days following the deposit thereof in the mail, and if given by facsimile, on the day of transmittal thereof. If the party giving any Notice knows or ought reasonably to have

known of any difficulties with the postal system that might affect the delivery of mail, any such Notice shall not be mailed but shall be given by personal delivery or facsimile.

**SUCCESSORS AND ASSIGNS:**

18. This Agreement and everything herein contained shall enure to the benefit of and be binding upon the parties hereto and their respective successors and assigns.

**PREVIOUS AGREEMENT:**

19. Except as otherwise described herein, this Agreement shall supersede and replace any and all prior agreements, oral or written, between the parties hereto (or their predecessors, as applicable) relating to the subject matter hereof.

**SEVERABILITY**

20. If any provision of this Agreement is determined to be invalid or unenforceable in whole or in part, such invalidity or unenforceability will attach only to such provision or part thereof and the remaining part of such provision and all other provisions hereof will continue in full force and effect.

**COUNTERPART EXECUTION**

21. This Agreement may be executed by facsimile and in counterpart form, with each counterpart deemed to be an original and the counterparts taken together, constituting one and the same agreement.

**IN WITNESS WHEREOF** the parties have executed this Agreement as of the \_\_\_\_ day of \_\_\_\_\_ in the year 20\_\_.

**CITY OF GRAND FORKS**

Per: \_\_\_\_\_  
Name:  
Title:  
Date:

**FORTISBC INC.**

Per: \_\_\_\_\_  
Name:  
Title:  
Date:

# **SCHEDULE “C”**

Wholesale Power Agreement between the City of Grand Forks and ForitisBC Inc.  
signed November 30, 2020



# **AGREEMENT FOR THE SUPPLY OF ELECTRICITY WHOLESALE SERVICE**

**BETWEEN**

**The Corporation of the City Of Grand Forks  
7217 4<sup>th</sup> Street  
Grand Forks, BC V0H 1H0**

**And**

**FortisBC Inc.  
1975 Springfield Road  
Kelowna, BC V1Y 7V7**

# Agreement for the Supply of Electricity Wholesale Service

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THIS AGREEMENT is made as of the \_\_ day of \_\_\_\_\_ 2020.

BETWEEN:

**FORTISBC INC.**, a corporation established by a special Act of the Legislature of the Province of British Columbia, having its head office in the City of Kelowna in the Province of British Columbia,. ("FortisBC"),

AND:

**THE CORPORATION OF THE CITY OF GRAND FORKS**, a company incorporated under the laws of British Columbia and having an office in the City of Grand Forks in the Province of British Columbia. ("City of Grand Forks"),

WHEREAS FortisBC is a supplier of electricity in the southern interior region of the Province of British Columbia;

AND WHEREAS the City of Grand Forks wishes to purchase electricity from FortisBC for its own use and for resale to City of Grand Forks customers within the City of Grand Forks' Service Area as hereinafter described;

AND WHEREAS both FortisBC and the City of Grand Forks have agreed to the principles set forth in the Proposed Settlement Agreement resulting from the British Columbia Utilities Commission Decision dated March 10, 1999.

NOW THEREFORE this Agreement witnesses that in consideration of the terms and conditions hereinafter set forth the Parties covenant and agree as follows:

## 1. DEFINITIONS

In this Agreement:

- (a) "**Check Metering**" means any measurement device or system installed, owned and maintained by the City of Grand Forks to check the measurements and calculations carried out by the Metering System.
- (b) "**BCUC**" means the British Columbia Utilities Commission.
- (c) "**Commodity Service**" means the supply of power, expressly excluding the services set forth in the Transmission Services Tariff, to the City of Grand Forks by a third party and may include full or partial supply of the load requirements of the City of Grand Forks.
- (d) "**Demand**" has the meaning given to it in subsection 9.4.
- (e) "**Demand Limit**" means the capability of FortisBC's facilities at each of the Points of Delivery, specified in Appendix A attached hereto.
- (f) "**Demand Period**" has the meaning given to it in subsection 9.4.
- (g) "**Good Utility Practice**" means any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the

relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the WECC region.

- (h) **“Load Forecast”** means the demand load forecast referred to in subsection 7.4.
- (i) **“Maximum Demand”** means the highest clock hour of taking of electricity by the City of Grand Forks recorded in kilovolt-amperes by FortisBC from time to time.
- (j) **“Metering System”** means the measurement device or system installed, owned and maintained by FortisBC used to determine the City of Grand Forks' electricity consumption.
- (k) **“Parties”** means both FortisBC and the City of Grand Forks.
- (l) **“Point of Delivery”** means the point or points at which the City of Grand Forks' distribution system attaches to FortisBC's facilities, as specifically described in Appendix A attached hereto.
- (m) **“Power Factor”** means the percentage determined by dividing the City of Grand Forks' demand measured in kilowatts by the same demand measured in kilovolt-amperes.
- (n) **“APSA”** means the Access Principles Settlement Agreement, also known as the Proposed Settlement Agreement, as amended from time to time, attached as Appendix A to the BCUC Order Number G-27-99 dated March 10, 1999 in the matter of the Access Principles Application.
- (o) **“Service Area”** means the City of Grand Forks' service area, the boundaries of which are shown by the red line on the map identified as the City of Grand Forks' Electrical Service Boundaries, attached hereto as Appendix B and shall include any area(s) added from time to time by the municipality.
- (p) **“Services”** means the supply and delivery of power to the City of Grand Forks by FortisBC under this Agreement.
- (q) **“Term”** means the period defined by subsection 2.1 herein.
- (r) **“Transmission Services Tariff”** means the tariff as approved from time to time by the BCUC for the use by a third party supplier to deliver power to the City of Grand Forks or by the City of Grand Forks to deliver power to a third party on the transmission and distribution facilities of FortisBC, including ancillary services required for the delivery of power.
- (s) **“WECC”** means Western Electricity Coordinating Council or a successor organization.

## **2. TERM OF AGREEMENT**

### **2.1 Term**

The term of this Agreement shall be for a period of five years commencing on \_\_\_\_\_, 2020. Upon expiration of that period this Agreement shall automatically be renewed for one additional five year period, unless the City of Grand Forks, not less than one year nor more than 2 years before the expiration of the initial five year term, notifies FortisBC in writing of the termination of this Agreements, effective as of the end of the initial term.

### **2.2 Early Termination**

If the City of Grand Forks elects to engage any third party supplier to perform the Commodity Services and notice as provided for in the APSA is given to FortisBC the City of Grand Forks may terminate this Agreement prior to expiry of the Term. If this Agreement terminates pursuant to this subsection, the City of Grand Forks may then be liable to pay such costs, including stranded costs, if any, as directed by the BCUC.

## **3. ACCESS PRINCIPLES SETTLEMENT AGREEMENT**

### **3.1 Access Principles Settlement Agreement Rights**

Nothing contained in this Agreement shall be construed as affecting in any way the rights of either Party as set forth in the APSA nor as affecting in any way the rights of either Party to unilaterally make application to the BCUC for further directions or orders from the BCUC related to the terms and conditions of the APSA.

### **3.2 Regulatory Principles**

If any provision of this Agreement is declared by the BCUC to be inconsistent with the regulatory principles set forth in the APSA, the Parties shall amend that provision in such reasonable manner as achieves the intention of the declaration of the BCUC. In the event the Parties cannot agree on such amendments, either Party shall be entitled to seek further direction from the BCUC and the Parties hereby agree to be bound by such direction from the BCUC.

## **4. CONDITIONS OF SUPPLY**

### **4.1 Supply of Electricity**

During the term of this Agreement, except in an emergency described in subsection 6.3, FortisBC shall supply up to the Demand Limit electricity required by the City of Grand Forks solely for its own use and for supplying the needs of its customers within the Service Area. FortisBC shall supply electricity to the Points of Delivery through suitable plant and equipment in accordance with Good Utility Practice on a continuous basis, except as provided in this Agreement. The responsibility of FortisBC for the delivery of electricity to the City of Grand Forks shall cease at the Points of Delivery.

### **4.2 Duty to Act Prudently in Arranging for Electricity Supply**

Notwithstanding the provisions of subsection 4.3 and 4.4 FortisBC has a duty not to be imprudent in arranging for the supply of electricity required pursuant to subsection 4.1 of

this Agreement and FortisBC will, subject to subsections 4.4 and 4.9, be liable to the City of Grand Forks for any loss, injury, damage or expense caused to the City of Grand Forks if the BCUC determines that FortisBC has failed to meet its duty not to be imprudent.

#### **4.3 Failure to Deliver**

At any time during an actual or anticipated shortage of electricity, or in the event of a breakdown or failure of generating, transmitting or distributing plant, lines or equipment, or in order to comply with the requirements of any law, FortisBC shall have the right to curtail or discontinue the supply of electricity to the City of Grand Forks or reduce the voltage or frequency of the electricity supplied. To the extent that it is practical and reasonable, FortisBC will not unduly discriminate in favour of or against the City of Grand Forks in the supply of electricity.

#### **4.4 Interruptions and Defect in Service**

The City of Grand Forks acknowledges and agrees that FortisBC's responsibility and liability for loss, injury, damage or expense caused by or resulting from any interruption, termination, failure or defect in the supply of electricity by FortisBC pursuant to this Agreement is limited by the terms and conditions of FortisBC's Electric Tariff, as amended from time to time.

#### **4.5 Commodity Services**

The City of Grand Forks shall have the rights set forth in the APSA to purchase power from a third party supplier and to meet part or all of its load requirements from Commodity Services.

#### **4.6 Limits on Other Supply**

Unless the City of Grand Forks has exercised its rights pursuant to the APSA, the City of Grand Forks shall, during the Term, only purchase electricity from FortisBC and the City of Grand Forks' own customers for its own use and the use of its customers within the Service Area. The City of Grand Forks may obtain electricity from new generation owned and operated by the City of Grand Forks, generation owned and operated by a third party and generated within the City of Grand Forks' electrical boundary, or the City of Grand Forks' customers.

#### **4.7 Retail Access on the City of Grand Forks' Facilities**

The City of Grand Forks shall give notice, consistent with the APSA requirements, in writing to FortisBC prior to providing the City of Grand Forks' transmission and distribution services for the direct delivery of third party supply to a customer of the City of Grand Forks.

#### **4.8 Sales out of Service Area**

If service to a customer outside or within the Service Area would require duplication of existing electrical plant which duplication could be avoided, then the Party that has the right to serve that customer pursuant to this Agreement may consent to the other Party serving that customer, such consent not to be unreasonably delayed or withheld.

**4.9 No Liability for Consequential Damages**

Neither Party, nor its directors, officers, employees or agents, will be liable to the other Party, or its directors, officers, employees or agents, in contract, tort, warranty, strict liability or any other legal theory for any indirect, consequential, incidental, punitive or exemplary damages arising under or in connection with this Agreement.

**5. CONDITIONS OF SERVICE**

**5.1 Supply Characteristics**

The electricity to be supplied to the City of Grand Forks shall be three-phase alternating current, having a nominal frequency of 60 hertz and the nominal voltages designated in Appendix A for the Points of Delivery, as amended from time to time.

FortisBC is a Registered Entity under the British Columbia Mandatory Reliability Standards ("MRS") Program. FortisBC is committed to ensuring compliance with the reliability standards adopted in British Columbia. The BCUC administers the BC MRS Program and can impose penalties for non-compliance.

The BCUC may exercise its authority by whatever means it deems appropriate in the event that frequency or voltage excursions occur that could reasonably have been prevented.

**5.2 Underground Facilities**

When the City of Grand Forks requests FortisBC to construct or install City of Grand Forks facilities underground, the City of Grand Forks shall be responsible for the difference between the cost of constructing or installing the facilities underground and the cost of constructing or installing similar facilities above ground.

**5.3 Ownership of Facilities**

Notwithstanding the payment of any contribution by the City of Grand Forks toward the cost of facilities pursuant to subsection 5.2, FortisBC shall retain full title to all facilities.

**5.4 Revenue Guarantee**

The City of Grand Forks may be required to provide a revenue guarantee if FortisBC's facilities must be upgraded significantly to meet a proposed increase in the City of Grand Forks' load in excess of 5000 kVA resulting from either a new City of Grand Forks customer or the increased load of an existing City of Grand Forks customer. The revenue guarantee will be equal to the cost of upgrading the facilities and will be refunded, with interest, in equal installments over a period of five years at the end of each year of continued service to that customer at the increased load. The revenue guarantee shall be in the form of cash, surety bond or other form of security satisfactory to FortisBC.

## **6. INTERCONNECTED OPERATION**

### **6.1 Obligation of FortisBC**

The maintenance by FortisBC of the agreed frequency and voltage at the Points of Delivery, set out in Appendix A, shall constitute delivery of electricity under this Agreement, whether or not any electricity is taken by the City of Grand Forks, and shall, subject to subsection 10.1 constitute the complete discharge by FortisBC of its obligations to the City of Grand Forks for Services.

### **6.2 Use of Facilities**

Each Party shall cooperate with the other to secure the most efficient use of the plant and equipment of the other Party, which may include wheeling power through the other Party's transmission and distribution circuits to facilitate supply to either Party or its customers.

### **6.3 Exceeding Demand Limit**

The City of Grand Forks shall not take electricity in excess of the Demand Limit of a Point of Delivery without the prior written consent of FortisBC, unless an emergency condition requires that the City of Grand Forks take in excess of the Demand Limit, and then only for the duration of the emergency condition. The City of Grand Forks shall immediately advise FortisBC when such an emergency condition occurs. The City of Grand Forks shall reduce immediately its use of electricity to the Demand Limit for that Point of Delivery or to a specified limit above the Demand Limit upon the oral or written request of FortisBC.

### **6.4 Restrict or Suspend Service**

If the City of Grand Forks fails to comply with the request of FortisBC pursuant to the previous paragraph, FortisBC may, when necessary in the opinion of FortisBC, restrict or suspend the supply of electricity to the City of Grand Forks at the Point of Delivery summarily without further notice.

### **6.5 Avoidance of Excess Loads**

The City of Grand Forks shall provide for interconnection of its lines so as to transfer and arrange the loads taken at each Point of Delivery to balance as far as is practicable the loads at each Point of Delivery given the Demand Limit at each Point of Delivery.

### **6.6 Maintenance of Adequate Supply Capability**

#### **6.6.1 Where**

- (a) except in an emergency condition described in subsection 6.3, the City of Grand Forks notifies FortisBC that it has taken electricity in excess of 95 percent of the Demand Limit of a Point(s) of Delivery; or
- (b) FortisBC's Load Forecast indicates that the City of Grand Forks' expected load at a Point(s) of Delivery is in excess of 95 percent of the Demand Limit;

FortisBC shall take appropriate measures, consistent with Good Utility Practice, at no cost to the City of Grand Forks, to increase FortisBC's supply capability at such Point(s) of Delivery to bring the City of Grand Forks' anticipated future demand to or below 95 percent of the Demand Limit, subject to any regulatory approval required for such upgrades by FortisBC and in accordance with FortisBC's usual timeframes, which are at present approximately three (3) years, for the planning, regulatory approval, design, and construction of such upgrades.

6.6.2 In the event that the City of Grand Forks requests FortisBC to increase FortisBC's supply capability at a Point(s) of Delivery prior to 95 percent of the Demand Limit being reached, the City of Grand Forks shall pay FortisBC for FortisBC's cost in carrying out the upgrade. Subsequently, if and when 95 percent of the Demand Limit is reached as measured load at the Point(s) of Delivery, excluding emergency conditions described in subsection 6.3, FortisBC will reimburse the City of Grand Forks for the cost of the upgrade. In the case the Parties cannot agree on the manner in which to calculate the cost of the upgrade or the reimbursement cost of the upgrade, either party may refer the matter to dispute resolution as contemplated in subsection 12.5.

6.6.3 The City of Grand Forks shall notify FortisBC of any proposed addition of generation resources greater than 1 MW in size owned by the City of Grand Forks or within the City of Grand Forks Service Area no less than 24 months before the construction of such generation in order to allow FortisBC to assess the impact of such addition to FortisBC's supply capability. In the event that FortisBC determines that upgrades to FortisBC's protection or communications systems are required, FortisBC shall notify the City of Grand Forks of FortisBC's estimated construction costs of such required upgrades before undertaking construction. Subject to section 6.6.4 below, the City of Grand Forks shall pay FortisBC for all FortisBC's costs in planning and constructing the required upgrades, however FortisBC shall pay for the operating costs of any completed upgrades.

6.6.4 The City of Grand Forks is not responsible for any costs to the FortisBC system from the addition of generation resources that are not owned by the City of Grand Forks.

## **6.7 City of Grand Forks' Facilities**

The City of Grand Forks shall be responsible for designing, constructing, installing and maintaining all auxiliary and interconnecting equipment on the City of Grand Forks' side of the Point of Delivery and the City of Grand Forks shall have ownership rights in all such auxiliary and interconnection equipment. FortisBC shall have no fiscal or other responsibilities in ensuring that such City of Grand Forks facilities meet the requirements of the City of Grand Forks' customers.

## **6.8 Installation of Facilities**

All electrical facilities owned by the City of Grand Forks from the Points of Delivery up to and including the City of Grand Forks' overload and overcurrent protection and isolation devices shall be approved and coordinated in a manner satisfactory to FortisBC, and may be inspected by FortisBC from time to time. Notwithstanding the foregoing, FortisBC shall not require a higher standard for the City of Grand Forks' electrical

facilities than the standard of FortisBC facilities supplying that portion of the City of Grand Forks' facilities.

**6.9 Coordination of Protective Devices**

Either Party shall notify the other Party in advance of any changes to its facilities that may affect the proper coordination of protective devices between the two systems.

**6.10 Power Factor**

The City of Grand Forks shall endeavor to regulate its load so that the Power Factor at each Point of Delivery will be no less than 95 percent, lagging, as mandated by BCUC Letter L-9-09.

**6.11 Load Fluctuations**

The City of Grand Forks shall maintain and operate its equipment, and shall endeavor to ensure that its customers equipment is operated in a manner that will not cause sudden fluctuations to FortisBC's line voltage, or introduce any influence into FortisBC's system deemed by FortisBC to threaten to disturb or disrupt its system or the plant or property of any other customer of FortisBC or of any other person.

**6.12 Hazard to Property and Public Safety**

Each of the Parties shall operate and maintain electrical plant within the Service Area so as to avoid hazard to the property of the other Party or danger to persons. To avoid hazard to property and to ensure public safety, the Parties agree that:

- (a) All electrical generating facilities larger than 1 MVA intended to be operated by the City of Grand Forks or third parties within the Service Area and in parallel with FortisBC's electrical system shall be installed only after the City of Grand Forks and FortisBC have reviewed and determined that the facilities will not have a negative impact on the City of Grand Forks' system and they are engineered in a manner acceptable and approved by FortisBC acting reasonably for the installation of such generating facilities.
- (b) The City of Grand Forks will provide copies to FortisBC of the full particulars of any approved generating facilities.
- (c) The City of Grand Forks shall ensure that all standby generation facilities located within the Service Area shall be installed so that they remain at all times electrically isolated from FortisBC's electrical system either directly or indirectly, and the standby facilities are capable of operating in parallel with FortisBC's electrical system they are engineered in a manner acceptable and approved by FortisBC acting reasonably.

**6.13 Permit to Install & Access**

If any equipment or facilities associated with any Point of Delivery and belonging to a Party to this Agreement are or are to be located on the property of the other Party, a permit to install, test, maintain, inspect, replace, repair and operate during the term of this Agreement and to remove such equipment and facilities at the expiration of the

Term, together with the right of entry to said property at all reasonable times is hereby granted by the other Party.

The rights hereby granted shall be exercised subject to prior notification and to any reasonable requirement of the granting Party necessary for the safety or security of that Party's facilities and employees and the continuity of that Party's operations.

#### **6.14 Use of City Streets and Lanes**

The City of Grand Forks acknowledges the rights, powers and authority of FortisBC under the *West Kootenay Power and Light Company, Limited Act*, 1897 (British Columbia), S.B.C. 1897, c. 63, (the "FortisBC Act") as amended and the *Utilities Commission Act*, including but not limited to FortisBC's rights to operate its facilities in the streets and lanes of the City of Grand Forks, and nothing in this Agreement fetters or otherwise interferes with or limits, or shall be construed to fetter or otherwise interfere with or limit, the rights, powers and authority of FortisBC under any statute in force in British Columbia, including, but not limited to, the FortisBC Act and the *Utilities Commission Act*. Notwithstanding the foregoing, during the term of this Agreement, FortisBC shall seek the approval of the City of Grand Forks as to the location of new poles being installed by FortisBC, such approval not to be unreasonably withheld by the City of Grand Forks.

#### **6.15 Drawings to be Provided**

If either Party is required or permitted to install, test, maintain, inspect, replace, repair, remove or operate equipment on the property of the other, the owner of such property shall furnish the other Party with accurate drawings and wiring diagrams of associated equipment and facilities, or, if such drawings or diagrams are not available, shall furnish accurate information regarding such equipment or facilities. The owner of such property shall notify the other Party of any subsequent modification which may affect the duties of the other Party in regard to such equipment, and furnish the other Party with accurate revised drawings, if possible.

#### **6.16 Inspection of Facilities**

Each Party may, for any reasonable purpose under this Agreement, inspect the other Party's electrical installation at any reasonable time after giving suitable notice. Such inspection, or failure to inspect, shall not render such Party, its officers, agents, or employees, liable or responsible for any injury, loss, damage, or accident resulting from defects in such electric installation, or for violation of this Agreement. The inspecting Party shall observe written instruction and rules posted in facilities and such other necessary instructions or standards for inspection as the Parties agree to. Only those electric installations used in complying with the terms of this Agreement shall be subject to inspection.

### **7. PLANNING AND OPERATING INFORMATION**

#### **7.1 Increases in Maximum Demand**

The City of Grand Forks shall notify FortisBC in writing of any anticipated additional single load in excess of 5000 kVA resulting from a new customer or the increased load of an existing customer, providing as much advance notice of the increase as can be given in the circumstances. FortisBC shall endeavor to provide the service requested by

the date the increase is intended to become effective, or as soon thereafter as is practicable.

## **7.2 Records and Forecasts**

Each Party shall retain and make available upon request for the other Party log sheets, records of recording meters, and any other readily available information of an operational character relating to the electricity supplied under this Agreement, excluding non-public records of a financial or business nature relating to the City of Grand Forks' utility undertaking.

## **7.3 General Information Requests**

The Parties agree to cooperate in the full exchange of such planning and operating information as may be reasonably necessary for the timely and efficient performance of the Parties' obligations or the exercise of rights under this Agreement. Such information shall be provided on a timely basis and no reasonable request shall be refused.

## **7.4 Load-Resource Forecast**

By June 30 of each year, the Parties agree to exchange a five year forecast of loads and resources for their respective electrical systems including a forecast of their Maximum Demand at each Point of Delivery normalized for average weather conditions and shall also provide a forecast of energy consumption for each year. The Load Forecasts shall include programs for resource acquisition, transmission and firm loads. The degree of detail in the Load Forecasts shall be decided by mutual agreement.

## **7.5 Load from Previous Year**

Before the end of February in each year, the City of Grand Forks shall provide FortisBC with a record of the number of customers and load by customer class for the previous calendar year.

## **7.6 Scheduled and Maintenance Outages**

Each party shall submit to the other Party a list of outages scheduled for inspection, testing, preventative maintenance, corrective maintenance, repairs, replacement or improvements that might affect the delivery of electricity under this Agreement, providing as much advance notice of the outage as can be given in the circumstances. The Parties shall use reasonable efforts to keep such schedules current and to revise such schedules so as to minimize the impact on the other Party's system.

## **8. METERING**

### **8.1 Installation**

FortisBC shall furnish, install and maintain the Metering System and the City of Grand Forks, in accordance with subsection 8.3, may furnish, install and maintain the Check Metering, each at their own expense, at the Points of Delivery, which shall accurately measure and record electricity within the limits prescribed by the federal Department of Consumer and Corporate Affairs ("Prescribed Limits") and pursuant to subsection 8.7.

## **8.2 Totalizing Metering**

FortisBC shall also, at its expense, install totalizing metering to compensate for demand diversity at the different Points of Delivery.

## **8.3 Check Metering**

Check Metering and connecting equipment and facilities to be furnished by the City of Grand Forks shall be satisfactory to FortisBC, and shall be installed in accordance with Good Utility Practice and in a manner satisfactory to FortisBC, acting reasonably.

## **8.4 Meter Tests and Adjustments**

Unless otherwise agreed to by the Parties, each Party shall, at its own expense, arrange to have its meters tested by an inspector or accredited meter verifier authorized pursuant to the federal *Electricity and Gas Inspection Act* and regulations, as amended from time to time.

## **8.5 Inspection of Metering Equipment**

Notwithstanding subsection 8.4, either Party may, after giving ten days' notice, inspect in the presence of the other Party, the metering equipment installed in accordance with this subsection by the other Party, and may request that that metering equipment be tested by an inspector or authorized meter verifier.

If the result of any test performed pursuant to this subsection shows that any of the metering equipment is not recording within the Prescribed Limits, then the owner of that metering equipment shall pay for the costs of testing.

If after testing the metering equipment is found to be recording within the Prescribed Limits, the Party that made the request shall pay for the costs of testing.

## **8.6 Calculating the Amount to be Paid**

The measurements recorded by the Metering System shall be used for calculating the amount to be paid for the electricity delivered to the City of Grand Forks, except in the following circumstances:

- (a) if a totalizing meter is temporarily not in service or is found after testing to be not recording within the Prescribed Limits then the measurements recorded by the City of Grand Forks' totalizing meter shall be used to determine the total consumption and demand, or, in the absence of a City of Grand Forks totalizing meter, FortisBC's meters shall be used to determine the total consumption and demand taking into account established load diversity until FortisBC's totalizing meter has been recalibrated;
- (b) if the Metering System is not in service or is found after testing to be not recording within the Prescribed Limits then the measurements recorded by the City of Grand Forks' totalizing meter or, in the absence of a totalizing meter, the City of Grand Forks' meters shall be used for calculating the amount to be paid for electricity delivered to the City of Grand Forks;

- (c) if neither the Metering System nor the Check Metering are in service or are found after testing to be not recording within the Prescribed Limits then the amount of electricity delivered since the previous billing shall be estimated from the best information available.

**8.7 Prescribed Limits**

If at any time the testing described in subsections 8.4 and 8.5 shows that the metering equipment was not recording within the Prescribed Limits, and if such recordings were used for billing purposes, then the billings shall be adjusted as prescribed by the *Electricity and Gas Inspection Act*.

**8.8 Access to Meters**

Each Party shall have the right, by giving suitable notice, to enter the property of the other Party at all reasonable times for the purpose of reading any and all meters mentioned in this Agreement which are installed on such property.

**9. INVOICES AND PAYMENT**

**9.1 Meter Reading**

Meters shall be read at the end of each month. An accurate record of all meter readings shall be kept by FortisBC and shall be the basis for determination of all bills rendered for service.

**9.2 Invoices and Payment**

FortisBC shall render a billing invoice monthly pursuant to the terms of FortisBC's Electric Tariff, as amended from time to time.

**9.3 Rates for Electricity**

The City of Grand Forks shall pay for Services during the Term in accordance with the Electric Tariff Rate Schedule 40 – Wholesale Service - Primary applicable to the City of Grand Forks filed with the BCUC, as amended from time to time.

**9.4 Demand Period and Demand**

For billing purposes, Demand Period means the period, expressed in minutes, over which meter readings are integrated to obtain the Demand, which is the power measured in kilovolt amperes (kVA), or multiples thereof, at the Point of Delivery. In this Agreement and for billing purposes, the Demand Period shall be a sixty minute clock hour interval.

**9.5 Billing Adjustments**

If FortisBC suspends or reduces Service for reasons other than a request by the City of Grand Forks or an interruption of Service caused by the City of Grand Forks' system, and the suspension or reduction results in a peak Demand which would otherwise be used for billing purposes, the Demand in the Demand Period immediately following restoration of service may be reduced, by mutual agreement, to an estimate of what the Demand would have been if Service had not been suspended or reduced. The estimate

shall be determined in consideration of weather conditions and previous load experience.

#### **9.6 Late Payments**

If the amount due on any invoice has not been paid in full after twenty calendar days from the billing date shown on the invoice, a late payment charge shall be applied to the unpaid balance, and the resulting amount will be shown and identified on the next invoice to be rendered. The late payment charge shall be as specified in FortisBC's Electric Tariff, as amended from time to time.

#### **9.7 Taxes**

In addition to payments for electricity, the City of Grand Forks shall pay to FortisBC the amount of any sales tax, goods and services tax, or any other tax or assessment levied by any competent taxing authority on any electricity delivered pursuant to this Agreement.

#### **9.8 Payment of Accounts**

The City of Grand Forks shall pay to FortisBC the amount of the billing within 20 calendar days from the date appearing on the invoice.

### **10. CONTINUITY OF SUPPLY**

#### **10.1 Standard of Performance**

FortisBC shall perform the Services with skill, care, and diligence consistent with Good Utility Practice and consistent with directions from the BCUC, including the quality performance standards, if any, approved by the BCUC from time to time.

#### **10.2 Interruptions and Defects in Service**

FortisBC shall avoid interruption of delivery of electricity, but nevertheless shall not be liable to the City of Grand Forks for any loss or damage owing to failure to supply electricity, or owing to other abnormal conditions of supply resulting from force majeure as defined in subsection 12.1.

#### **10.3 Suspension of Supply**

Either Party shall have the right to demand the temporary suspension of, or to suspend temporarily, the delivery or taking of electricity, as the case may be, whenever necessary to safeguard life or property, or for the purpose of replacing, repairing or maintaining any of its apparatus, equipment, or works. Such reasonable notice of the suspension as the circumstances permit shall be given by one Party to the other Party.

#### **10.4 Discontinue Service**

FortisBC may discontinue the supply of electricity to the City of Grand Forks at a Point of Delivery for the failure by the City of Grand Forks to commence remedial action acceptable to FortisBC, within 15 days of receiving notice from FortisBC, to correct the breach of any significant practice, term or condition to be observed or performed by the City of Grand Forks under this Agreement. FortisBC acting reasonably shall be under

no obligation to resume service until the City of Grand Forks gives assurances satisfactory to FortisBC that the breach which resulted in the discontinuance shall not recur.

#### **10.5 Obligations Continue**

Discontinuance of Services by FortisBC pursuant to the provisions of this Agreement shall not relieve the City of Grand Forks of any obligation under this Agreement, or alter any of the obligations of the City of Grand Forks under this Agreement.

#### **10.6 Other Remedies**

FortisBC's right to discontinue the supply of electricity under this Agreement shall not operate to prevent FortisBC from pursuing, separately or concurrently, any other remedy it may have under this Agreement or by operation of law.

### **11. REMOVAL OF FACILITIES UPON TERMINATION**

After the termination of this Agreement, FortisBC shall have the right to, and must expeditiously if requested by the City of Grand Forks, remove from the property owned or controlled by the City of Grand Forks any and all electrical apparatus and equipment which FortisBC owns and has installed on the property and FortisBC shall leave the property in good repair after such removal.

### **12. GENERAL PROVISIONS**

#### **12.1 Force Majeure**

Neither Party to this Agreement shall be considered to be in default in the performance of any of its obligations under this Agreement to the extent that performance of those obligations is prevented or delayed by any cause which is beyond the reasonable control of the Party prevented or delayed by that cause. If either Party is delayed or prevented from its performance at any time by any act, omission or neglect of the other Party or its representatives, or by an act of God or the public enemy, or by expropriation or confiscation of facilities, compliance with any order of any governmental authority or order of a court of competent jurisdiction, acts of war, rebellion or sabotage, fire, flood, explosion, riot, strike or other labour dispute beyond the reasonable control of the Party or any unforeseeable cause beyond the control and without the fault and negligence of the Party, the Party so prevented or delayed shall give notice to the other Party of the cause of the prevention or delay but, notwithstanding giving of that notice, the Party shall promptly and diligently use reasonable efforts to remove the cause of the prevention or delay.

#### **12.2 Notices**

Any notice, direction or other instrument required or permitted to be given under this Agreement in writing shall be sufficient in all respects if delivered, or if sent by fax, or if sent by prepaid registered post in Canada to the Parties at their respective addresses as they appear in subsection 12.3, or to any substitute address of which the Party sending notice has had notice in writing.

### 12.3 Addresses

Any notice, direction or other instrument shall be delivered or sent to the following addresses:

(a) To FortisBC:

FortisBC Inc.  
1975 Springfield Road  
Kelowna, BC V1Y 7V7  
Attention: Legal Department

(b) To the City of Grand Forks:

The Corporation of the City of Grand Forks  
7217 4<sup>th</sup> Street  
Grand Forks, BC V0H 1H0  
Attention: Chief Administrative Officer  
with a copy to: Manager of Operations  
Email: info@grandforks.ca

### 12.4 Dates

Any notice, direction, or other instrument shall be deemed to have been received on the following dates if,

- (a) sent by fax, on the business day next following the date of transmission.
- (b) delivered, on the business day next following the date of delivery.
- (c) sent by registered mail, on the fifth business day following its mailing, provided that if there is at the time of mailing or within two days thereafter a mail strike, slowdown, lockout or other labour dispute which might affect delivery, then any notice, directions or other instrument shall only be deemed to be effective if delivered or sent by fax.

### 12.5 Disputes

If any difference or dispute occurs regarding any matter arising under this Agreement, either Party may request that the BCUC settle the difference or dispute. If the BCUC declines to settle the dispute then the dispute shall be arbitrated pursuant to the *Arbitration Act* of British Columbia.

### 12.6 Invalidity

If any provision of this Agreement or the application of any provision to any Party or circumstance is declared or held to be wholly or partially invalid, this Agreement shall be interpreted as if the invalid provision had not been a part hereof so that the invalidity shall not affect the validity of the remainder which shall be construed as if this Agreement had been executed without the invalid portion. FortisBC and the City of Grand Forks shall, either independently, jointly or in concert with other wholesale customers of FortisBC, make all reasonable efforts to validate any portion of this Agreement declared or held to be invalid.

## **12.7 Headings**

The headings in this Agreement have been inserted for convenience of reference only, and shall not affect the construction or interpretation of this Agreement.

## **12.8 Enurement**

This Agreement shall be binding upon and shall enure to the benefit of the Parties hereto and of their respective successors and assigns.

## **12.9 Governing Law**

Notwithstanding anything to the contrary in this Agreement, FortisBC shall comply fully with all applicable federal, provincial, and municipal laws of general application (including bylaws) in effect from time to time.

## **12.10 Entire Agreement**

This Agreement and the Appendices attached hereto are intended by the Parties to be the final expression of their agreement and are intended also as a complete and exclusive statement of the terms of this Agreement.

## **12.11 BCUC Approval**

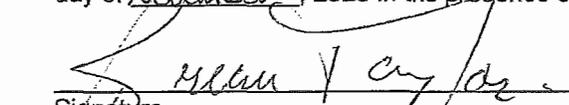
This Agreement and all the terms and conditions contained in it shall be subject to the provisions of the *Utilities Commission Act* of British Columbia, as amended or re-enacted from time to time and to the jurisdiction of the BCUC and the parties agree to make such amendments to the agreement as required or ordered by the BCUC from time to time.

## **12.12 Counterparts**

This Agreement may be executed and delivered in any number of counterparts with the same effect as if all parties had signed and delivered the same document and all counterparts will be construed together to constitute one and the same agreement. A party may deliver an executed copy of this Agreement in electronic form and will immediately deliver to the other party an originally executed copy of this Agreement.

IN WITNESS WHEREOF the Parties have executed this Agreement by their duly authorized signatories.

The Seal of **THE CORPORATION OF THE CITY OF GRAND FORKS** was hereunto affixed the 30 day of November, 2020 in the presence of

  
\_\_\_\_\_  
Signature

Brian Taylor  
\_\_\_\_\_  
Print Name

Mayor  
\_\_\_\_\_  
Title

  
\_\_\_\_\_  
Signature

Duncan Redfern  
\_\_\_\_\_  
Print Name

CAO  
\_\_\_\_\_  
Title

**FORTISBC INC.**

  
\_\_\_\_\_  
Signature

DOYLE SAM  
\_\_\_\_\_  
Print Name

EVP, OPERATIONS + ENGINEERING  
\_\_\_\_\_  
Title

Appendix A

City of Grand Forks - Points of Delivery

**1. Ruckles Substation**

Description: Line side of City's 13 kV Gang Switch in City's yard adjacent to Ruckles Substation

Nominal Voltage Supplied: 13 kV

Demand Limit: Summer 10 MVA  
Winter 10 MVA

**2. Donaldson Drive**

Description: Line side of City's recloser disconnects on Donaldson Drive at southwest corner of intersection of Donaldson Drive and Coalchute Road

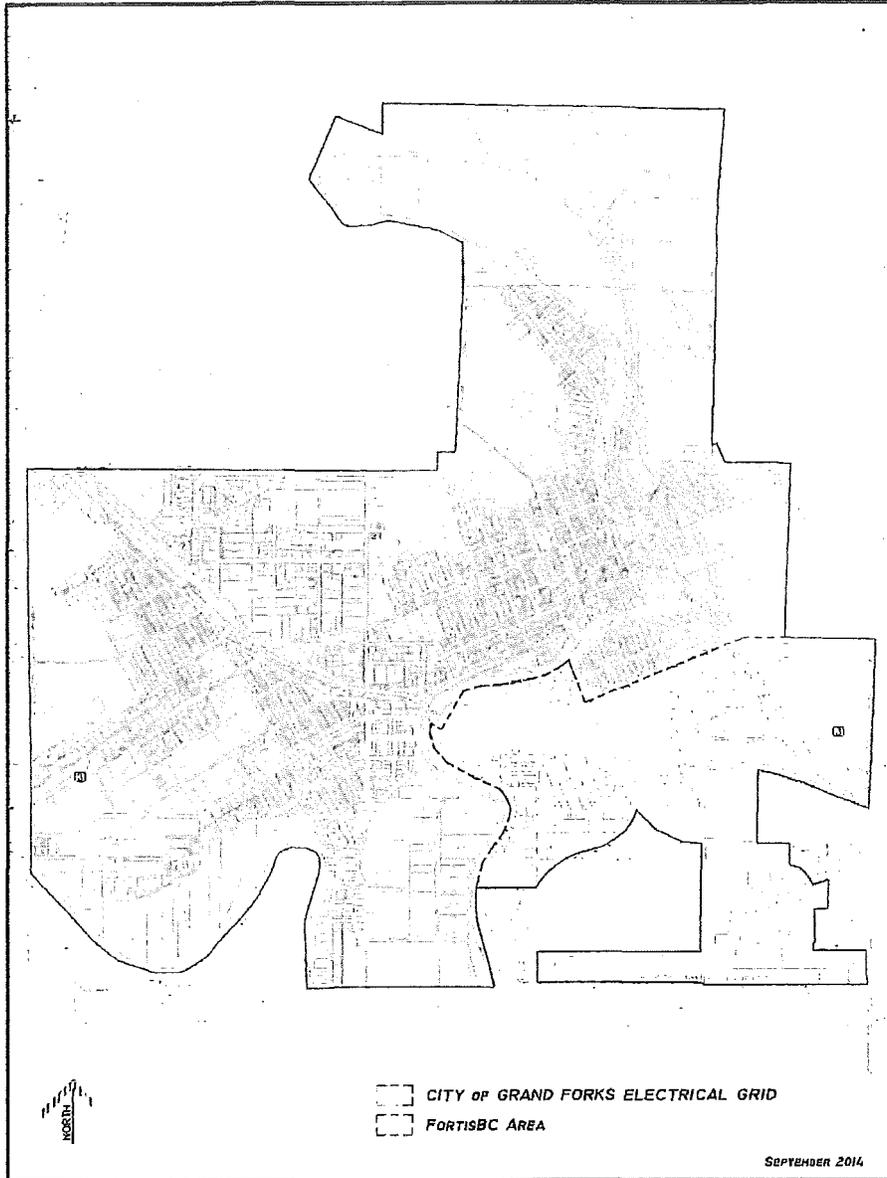
Nominal Voltage Supplied: 13kV

Demand Limit: Summer 6 MVA  
Winter 8 MVA

[NTD: Confirm with Fortis design limit of PoD and use that number]

## Appendix B

### Schedule "B" - City of Grand Forks Electrical Service Area



# **SCHEDULE “D”**

Copy of the Commission Letter Decision L-1-10-03 dated March 25, 2003



LETTER NO. L-10-03

ROBERT J. PELLATT  
COMMISSION SECRETARY  
Commission.Secretary@bcuc.com  
web site: <http://www.bcuc.com>

SIXTH FLOOR, 900 HOWE STREET, BOX 250  
VANCOUVER, B.C. CANADA V6Z 2N3  
TELEPHONE: (604) 660-4700  
BC TOLL FREE: 1-800-663-1385  
FACSIMILE: (604) 660-1102

Log No. 2150

VIA FACSIMILE  
(250) 365-6414

March 25, 2003

Mr. Ron Ross, P.Eng.  
Emco Engineering Ltd.  
186 Columbia Avenue  
Castlegar, B.C. V1N 1A9

Dear Mr. Ross:

Re: Pope & Talbot – Grand Forks, BC  
Bypass Rate Application - Emco File No. 0277A

On December 18, 2002, Emco Engineering Ltd. submitted a Bypass Rate Application to the Commission on behalf of Pope & Talbot Ltd. Pope & Talbot is applying for permission to build a 60 kV/4.16 kV substation in Grand Forks and move from Aquila Network's Rate Schedule 30 (Large General Service Primary) to Rate Schedule 31 (Large General Service – Transmission). The Application outlines Pope & Talbot's cost of bypass and the associated cost savings expected over the next 20 years, assuming 3 percent annual load growth.

Aquila's five-year distribution plan does not provide for any material expenditure on the existing substation that serves Pope & Talbot. Future expenditures on the substation are likely to be condition related, rather than load related. Moreover, Aquila anticipates very low growth rates in distribution service in the Grand Forks area. Aquila's incremental cost of serving Pope & Talbot under Rate Schedule 30 is not significant.

Aquila does not oppose Pope & Talbot's Application and would serve them under Rate Schedule 31 if they construct the substation. Aquila is concerned that the quality of Pope & Talbot's power supply will be reduced given that the proposed bypass facility would utilize a 38-year old transformer. In the event that this transformer fails, Aquila notes that it is not obligated to supply backup, but would do so on commercial terms only.

Aquila has provided revised cost estimates to the Pope & Talbot Application based on adjustments to a number of underlying assumptions, such as interconnection costs, protection requirements and the cost of capital. Pope & Talbot considers that it would be worthwhile to have Aquila provide them their detailed cost estimates in order to facilitate discussion of significant differences on an item by item basis. A key

outstanding issue for Aquila is that Pope & Talbot does not include an estimate of the expected cost of backup to explicitly account for the risk of the 38-year old transformer failing.

Pope and Talbot's cost of bypass exceeds Aquila's incremental cost of service. Based on this and considering the issue of backup supply that underlies this application, the Commission recommends that Pope & Talbot and Aquila negotiate a Bypass Rate and submit this rate to the Commission for final approval. Negotiation will allow the parties to resolve differences in their respective cost estimates and offer them an opportunity to agree on the expected cost of backup, given the risk of the transformer failing. In this context a negotiated Bypass Rate can be considered a rider to be added to Rate Schedule 31. The Bypass Rate should equal Pope & Talbot's cost of bypass all told and be payable to Aquila over the expected life of the proposed bypass facility, financed at Pope & Talbot's weighted average cost of capital.

The Commission agrees that this Application is essentially a quality of supply issue. Pope & Talbot is seeking to reduce costs by obtaining lower quality service. Aquila does not oppose their application and would serve them under Rate Schedule 31 if the proposed facility was built. The Commission expects that if the proposed bypass facility was built it would not impose costs on Aquila's other customers, provided it does not fail over its expected life. Therefore, the Commission recommends that if the parties cannot agree to a negotiated bypass rate, Pope & Talbot be allowed to construct and operate the proposed bypass facility under the condition that if backup is required, Pope & Talbot be required to pay all of the costs of backup to Aquila under terms agreed to by the parties in advance.

Yours truly,

*Original signed by:*

Robert J. Pellatt

RG/cms

cc: Mr. George Isherwood  
Regulatory Affairs Executive  
Aquila Networks Canada (British Columbia) Ltd.

Mr. Andrew Horahan  
Sawmill Superintendent  
Pope & Talbot, PO Box 39  
Grand Forks, BC V0H 1H0

**BYPASS RATE AGREEMENT**

**EFFECTIVE AS OF MAY 1, 2003**

**BETWEEN:**

**POPE AND TALBOT LTD.**

**- AND -**

**AQUILA NETWORKS CANADA (BRITISH COLUMBIA) LTD.**

**GRAND FORKS SAWMILL**

**CUSTOMER # 6805632149**

**AQUILA NETWORKS CANADA (BRITISH COLUMBIA) LTD.**

**1290 ESPLANADE**

**P.O. BOX 130**

**TRAIL, BC V1R 4L4**

**BYPASS RATE AGREEMENT** entered into by the parties on the \_\_\_\_ day of \_\_\_\_\_, 2003 but is effective as of May 31, 2003 (the "**Effective Date**").

This Agreement is made between AQUILA NETWORKS CANADA (BRITISH COLUMBIA) LTD. ("**Aquila**"), with a head office located at 1290 Esplanade, Trail, B.C., V1R 4L4 and POPE AND TALBOT LTD. (the "**Customer**"), located at Box 39, Grand Forks, B.C., V0H 1H0.

**WHEREAS** Aquila Networks Canada (British Columbia) Ltd. (at the time referred to as West Kootenay Power and Light Company, Limited) and the Customer entered into a General Service Power Contract dated November 1, 1985, pursuant to which Aquila agreed to supply and the Customer agreed to purchase electric service for use in the Customer's Grand Forks sawmill located at 570 - 68<sup>th</sup> Avenue in the Town of Grand Forks, in the Province of British Columbia, on the load side of Aquila's switch in the Ruckles compound substation (the "**Customer Facilities**");

**AND WHEREAS** subsequent to a Bypass Rate Application by the Customer, the British Columbia Utilities Commission ("**BCUC**") recommended by Letter No. L-10-03 dated March 25, 2003, that Aquila and the Customer negotiate a bypass rate (the "**Bypass Rate**") to reflect the bypass arrangement between the parties;

**AND WHEREAS** Aquila and the Customer have reached an agreement in their negotiation of a Bypass Rate, the details of which are specified herein;

**NOW THIS AGREEMENT WITNESSES** that in consideration of the mutual agreements and covenants contained herein and for other good and valuable consideration (the receipt and adequacy of which are hereby acknowledged by each of the parties hereto), the parties hereto agree as follows.

**PROVISION OF ELECTRIC SERVICE:**

1. Aquila agrees to provide electric service to the Customer and the Customer accepts such electric service and agrees to pay all charges specified in this Agreement, all upon and subject to the terms and conditions of this Agreement. Furthermore, the Customer acknowledges and agrees that the **Terms and Conditions** (as defined in Annex "A") automatically apply to the parties regarding the provision of electric service, and if there is any conflict or inconsistency raised between the Terms and Conditions and the terms of this Agreement, then this Agreement shall take precedence.
2. The point at which electricity passes to the Customer is the load side of Aquila's switch in the Ruckles compound substation as defined as the "**Point of Delivery**". Aquila's responsibility for supply of electricity shall cease at the Point of Delivery. Aquila will provide for electric service to the Point of Delivery up to a demand limit of 5,500 kVA of registered demand (the "**Demand Limit**"). The Demand Limit can be reduced or increased in accordance with the Terms and Conditions. Aquila will provide for electric service to the Point of Delivery such that electricity can be delivered to the Customer at a nominal voltage of 4,160 volts in the form of three-phase current and at a nominal frequency of 60 hertz.

**RATES AND CHARGES:**

3. The Customer agrees to pay on the terms described therein the relevant charges referenced in the Aquila Networks Canada (BC) Electric Tariff B.C.U.C. No. 1 as may be modified from time to time, which include, without limitation:
  - (a) Payments under Rate Schedule 31, as approved or revised by the BCUC from time to time, based on a Contract Demand of 5,000 kVA;
  - (b) A Bypass Rate rider of \$3,847.00 per month for a period of 240 months, effective retroactively as of the Effective Date (which monthly rider payment, each year on December 31, will be adjusted subject to an escalation rate based on the year over year change in the British Columbia all items Consumer Price Index for the prior October). Any modification of the Bypass Rate during the term of this Agreement shall be subject to BCUC approval;
4. The Contract Demand can be reduced or increased in accordance with the Terms and Conditions and the terms of this Agreement herein.

**SPECIAL PROVISIONS:**

5. If Aquila determines, acting reasonably, that the Customer has effectively closed the Grand Forks mill operation, then the Customer will pay to Aquila, an exit fee in accordance with Annex "B", or, at the Customer's option, this agreement in its entirety may be transferred to the Customer's mill in Midway, British Columbia, or any other of the Customer's mills in the Boundary area that is of similar size.
6. The Customer acknowledges that, notwithstanding any Customer Contribution that the Customer may be required to provide under this Agreement, the Customer shall not acquire any ownership interest in any of the equipment constructed, maintained or operated by Aquila, or any other person, to provide the electric service to the Customer.

**TERM AND TERMINATION:**

7. This Agreement shall have a initial term of two hundred-forty (240) months or twenty (20) years, and shall automatically be renewed for successive one (1) year periods thereafter unless terminated by either party as specified herein.
8. The Customer may terminate this Agreement by giving twelve (12) months prior written notice and upon payment of the applicable exit fee, in accordance with Annex "B", or, by providing twelve (12) months prior written notice and satisfying the conditions for transfer as described in clause 5 of this agreement. Such written termination notice shall be given in such manner that the Agreement terminates with the last day of a billing period.

**METERING OF POWER AND ENERGY:**

9. Electric service supplied to the Customer by Aquila will be metered by metering equipment owned and maintained by Aquila which will be installed at the Point of Delivery or at such other point as otherwise mutually agreed.

**THE CUSTOMER'S TECHNICAL OBLIGATIONS:**

10. The Customer will own, construct, maintain and operate the equipment necessary to accept electric service from Aquila from the Point of Delivery, with the exception of any equipment installed by Aquila or any other person, for and on behalf of Aquila, including any necessary metering equipment.

**ADDITIONAL CONTRACT TERMS:**

11. This Agreement is subject to Aquila obtaining, and Aquila's compliance with, all governmental orders, permits, approvals and consents required by law with respect to the provision of electric service. It is understood and agreed that Aquila's rates and charges hereunder are subject to regulation by the BCUC.
12. This Agreement may not be assigned by the Customer without the prior written consent of Aquila, which consent shall not be unreasonably withheld.
13. No amendment to this Agreement will be valid or binding unless set forth in writing and duly executed by both of the parties hereto. No waiver of any breach of any term or provision of this Agreement will be effective or binding unless made in writing and signed by the party purporting to give the same and, unless otherwise provided in the written waiver, will be limited to the specific breach waived.
14. The division of this Agreement into Sections and the insertion of headings are for convenience only and will not affect the construction or interpretation of this Agreement.
15. Any demand, notice or other communication ("Notice") required or permitted to be given in connection with this Agreement shall be given in writing and must be given by personal delivery, registered mail or facsimile transmittal as follows:

- (a) Notice to Aquila shall be addressed to:

AQUILA NETWORKS CANADA (BRITISH COLUMBIA) LTD.  
1290 Esplanade  
P.O. Box 130  
Trail, BC V1R 4L4  
Attention: Manager, Key Accounts  
Fax: (250) 364-2314

- (b) Notice to the Customer shall be addressed to:

POPE AND TALBOT LTD.  
P.O. Box 39  
570 - 68<sup>th</sup> Avenue  
Grand Forks, BC  
Attention: Plant Manager  
Fax: (250) 442-8655

or to such other address, facsimile number or individual as may be agreed between the parties in writing. Any Notice given by personal delivery shall be conclusively deemed to have been given on the day of actual delivery thereof and, if given by registered mail, five (5) business days following the deposit thereof in the mail, and if given by facsimile, on the day of transmittal thereof. If the party giving any Notice knows or ought reasonably to have known of any difficulties with the postal system that might affect the delivery of mail, any such Notice shall not be mailed but shall be given by personal delivery or facsimile.

**SUCCESSORS AND ASSIGNS:**

16. This Agreement and everything herein contained shall enure to the benefit of and be binding upon the parties hereto and their respective successors and assigns.

**PREVIOUS AGREEMENT:**

17. This Agreement shall supersede and replace any and all prior agreements, oral or written, between the parties hereto (or their predecessors, as applicable) relating to the subject matter hereof.

**SEVERABILITY:**

18. If any provision of this Agreement is determined to be invalid or unenforceable in whole or in part, such invalidity or unenforceability will attach only to such provision or part thereof and the remaining part of such provision and all other provisions hereof will continue in full force and effect.

**COUNTERPART EXECUTION**

19. This Agreement may be executed by facsimile and in counterpart form, with each counterpart deemed to be an original and the counterparts taken together, constituting one and the same agreement.

IN WITNESS WHEREOF the parties have executed this Agreement as of the \_\_\_\_ day of \_\_\_\_\_ in the year 20 \_\_\_\_.

**POPE AND TALBOT LTD.**

Per: \_\_\_\_\_  
Name:  
Title:  
Date:

Per: \_\_\_\_\_  
Name:  
Title:  
Date:

**AQUILA NETWORKS CANADA (BRITISH COLUMBIA) LTD.**

Aquila  
Checked by  
\_\_\_\_\_

Per: \_\_\_\_\_  
Name:  
Title:  
Date:

ANNEX "A"

Attached to and forming part of the Bypass Rate Agreement  
Effective as of May 1, 2003

Between:  
**POPE AND TALBOT LTD.**  
- and -  
**AQUILA NETWORKS CANADA (BRITISH COLUMBIA) LTD.**

**DEFINITIONS**

---

In this Agreement, the following words have the following meanings:

"**Electricity**" means both electric demand and electric energy.

"**Interruption**" means the time during which the supply voltage to the Customer Facilities falls to zero.

"**kVA**" means kilovolt-ampere or kilovolt-amperes.

"**kW**" means kilowatt or kilowatts.

"**kWh**" means kilowatt-hour or kilowatt-hours.

"**Month**" means a calendar month.

"**Power**" means electric power as measured in kW or kVA.

"**Power Factor**" means the ratio of usable power measured in kW to total power measured in kVA.

"**Terms and Conditions**" means the Terms and Conditions and Schedules of the Aquila Networks Canada (BC) Electric Tariff B.C.U.C. No. 1, as filed with, approved, amended and revised by the British Columbia Utilities Commission from time to time. The Terms and Conditions, and any approved amendments, shall form part of this Agreement. A copy of such Terms and Conditions has been provided to the Customer.

**ANNEX "B"**

Attached to and forming part of the Bypass Rate Agreement  
Effective as of May 1, 2003

Between:  
**POPE AND TALBOT LTD.**  
- and -  
**AQUILA NETWORKS CANADA (BRITISH COLUMBIA) LTD.**

**SCHEDULE OF EXIT FEES**

---

In this Agreement, should the Customer cease taking service under the provisions of either Clause 5 or Clause 8, the following exit fees shall be payable by the Customer to Aquila:

If the Customer ceases taking service within 5 years or less of the Effective Date:         \$163,000

If the Customer ceases taking service after 5 years, but within 10 years or less of the Effective Date:  
\$137,000

If the Customer ceases taking service after 10 years, but within 15 or less of the Effective Date:   \$70,000

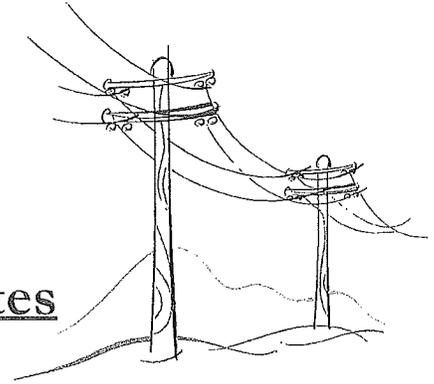
Each of the above payments shall be escalated by the increase in the British Columbia All items Consumer Price Index, between the Effective Date of the Agreement, and the date the Customer ceases taking service under the provisions of either Clause 5 or Clause 8.

	P&T Only		GF Only		Combined		P&T Only - Schedule 31 w/bypass				GF Only - Schedule 40				Combined - Schedule 40				
	kWh	kVA Max.	kWh	kVA Max.	kWh	kVA Max.	1856.72	4.53	0.03301	3924	Total	2859	6.16	0.03173	Total	4288	6.16	0.03173	Total
							Service	Demand	Energy	Rider		Service	Demand	Energy		Service	Demand	Energy	
January-04	1,559,018	4,800	4,242,998	9,015	5,902,016	13,153	1,857	21,752	51,480	3,924	78,992	2,859	55,717	134,640	193,215	4,288	81,292	164,111	269,891
February-04	1,511,334	4,781	3,625,754	6,606	5,137,089	10,951	1,857	21,865	49,886	3,924	77,331	2,859	42,066	115,053	159,976	4,288	67,685	163,011	234,984
March-04	1,483,832	4,550	3,364,626	6,383	4,858,258	10,529	1,857	20,821	48,301	3,924	75,703	2,859	41,788	106,787	151,413	4,288	65,072	154,163	223,523
April-04	1,497,066	4,288	2,811,516	5,121	4,306,582	9,050	1,857	19,432	49,415	3,924	74,827	2,859	41,788	89,216	133,862	4,288	60,969	136,721	201,978
May-04	1,214,624	4,173	2,791,770	4,998	4,006,394	6,818	1,857	18,910	40,092	3,924	64,762	2,859	41,788	88,589	133,235	4,288	60,969	127,132	192,389
June-04	1,446,077	4,128	2,862,728	6,437	4,308,605	10,278	1,857	18,707	47,732	3,924	72,219	2,859	41,788	90,641	135,487	4,288	63,526	136,728	204,542
July-04	1,420,553	4,198	3,219,582	6,682	4,640,146	10,390	1,857	19,026	46,890	3,924	71,895	2,859	41,788	102,184	146,811	4,288	64,219	147,242	215,748
August-04	1,425,795	4,061	3,204,030	6,571	4,829,826	10,286	1,857	18,402	47,062	3,924	71,245	2,859	41,788	101,571	146,317	4,288	63,574	148,915	214,776
September-04	1,559,155	4,019	2,841,557	5,234	4,400,712	6,781	1,857	18,214	51,484	3,924	75,459	2,859	41,788	90,169	134,615	4,288	60,969	139,644	204,801
October-04	1,810,912	4,362	3,218,073	6,128	4,828,985	10,165	1,857	19,765	53,173	3,924	78,719	2,859	41,788	102,117	146,783	4,288	62,824	153,234	220,347
November-04	1,822,573	4,525	3,674,126	8,940	5,496,699	11,037	1,857	20,505	60,159	3,924	86,445	2,859	42,828	116,589	162,375	4,288	68,214	174,422	246,925
December-04	1,889,443	4,579	4,097,987	7,430	5,967,440	11,261	1,857	20,752	61,708	3,924	88,238	2,859	45,919	130,036	178,816	4,288	69,597	189,360	263,245
January-05	1,857,053	4,605	4,391,290	6,253	6,348,343	11,908	1,857	20,868	64,598	3,924	91,246	2,859	51,007	139,345	193,210	4,288	73,596	201,447	279,331
February-05	1,602,394	4,554	3,583,182	6,543	5,365,586	10,742	1,857	20,836	59,493	3,924	85,909	2,859	40,436	113,088	156,383	4,288	68,389	170,282	240,839
March-05	1,849,450	4,458	3,412,625	5,982	5,262,074	10,041	1,857	20,200	61,046	3,924	87,027	2,859	38,255	108,280	149,404	4,288	62,059	166,877	233,324
	19,475,104		40,088,486		59,563,590						847,612			1,817,459					2,718,443
																			-48,628
										Sch. 30	1,029,346	81,734							
										Sch 40 +5%	1,004,020	56,408							

# **SCHEDULE “E”**

Original Cost Estimates for Grand Forks Substation

## Alternate Substation Sites



### Feeder Estimates, Details & Drawings

Based On two (2) Potential/Alternate Substation Sites

- 1) 6845 2nd St. (Preferred)
- 2) 6820 1st St. (Secondary)

#### Scope of Services:

- Site visit July 7, 2017 in order to assess the respective properties.
- Provision of documentation, estimates, layout and installation drawings based on the additional length of the three (3) underground feeders (F1, F2 & F3) from the two (2) noted properties routing to the current and future Underground Feeder Terminal Structures on located 4th St. across the street from Ruckles Substation.

#### Note:

Cost estimates were done utilizing, revising and expanding on the previously submitted estimate document(s) for the Grand Forks Electric Utility: Prospective 15MVA-63/12.4kV Substation Build for both options (*i.e. With E-House & No E-House*)

Report Date	Services Performed By:	Services Performed For:
August 13, 2017	Terry Andreychuk Consulting Ltd. 109 Ridge Terrace. Penticton, BC V2A 0B1 Cell. 250.809.6781 Email. tandreychuk@telus.net	Grand Forks Electric Utility Alex Love, P.Eng. Suite 101-310 Ward St. Nelson BC, V1L 5S4 Email. alove@nelson.ca

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## Administrative Summary

- The Prospective 15MVA-63/12.4kV Substation Build as previously submitted to Grand Forks in May, 2017 included a Property Acquisition allowance of \$250,000 as no property assessment values were attainable at the time of submission and discussions were taking place with Interfor to possibly acquire property adjacent to the existing FortisBC Substation (North Side). Eventual outcome of the discussions resulted in Interfor not willing to sell the requisite piece of property to Grand Forks. After which Mr. David Reid- Manager of Operations at the City of Grand Forks located the properties as noted c/w assessed values which were substantially lower than the allowance in the Prospective 15MVA-63/12.4kV Substation Build document per Line Item 2 Property Acquisition.
- Correspondingly as this estimate was explicit to the added Distribution Feeder lengths the section relative to the Conduit/15kV/Cables/Terminations from the Prospective 15MVA-63/12.4kV Substation Build document was modified and rationalized in greater detail with specific pricing acquired for all material items and the installation costs which resulted in a lower cost for this section when based on the original location adjacent to the FortisBC Substation (*Interfor Property*).
- The Control Cabling Supply & Installation Costs were also removed from this section and placed in its own sector or Line Item.
- Subsequently as would be the case due to the considerable decrease in the Property Allowance, an overall reduction in substation costs is experienced.

### NOTE:

Line Items in the estimate sheets have been (*Red Highlighted*) to identify items in the estimates where changes were made to the original prospective.



Subject Parcel  
0.452 acres / private and City-owned  
Private 0.305 acres / \$57,300  
City 2\*0.076 acres @ \$20,100

2:12,200



The City of Grand Forks makes every effort to ensure this map is free of errors but cannot guarantee accuracy or fitness for any purpose, and does not provide warranty of any kind. The City accepts no liability for any expenses, losses, damages and costs relating to use of this map or data. Data shall not be used for direct marketing or be used in breach of the privacy laws.





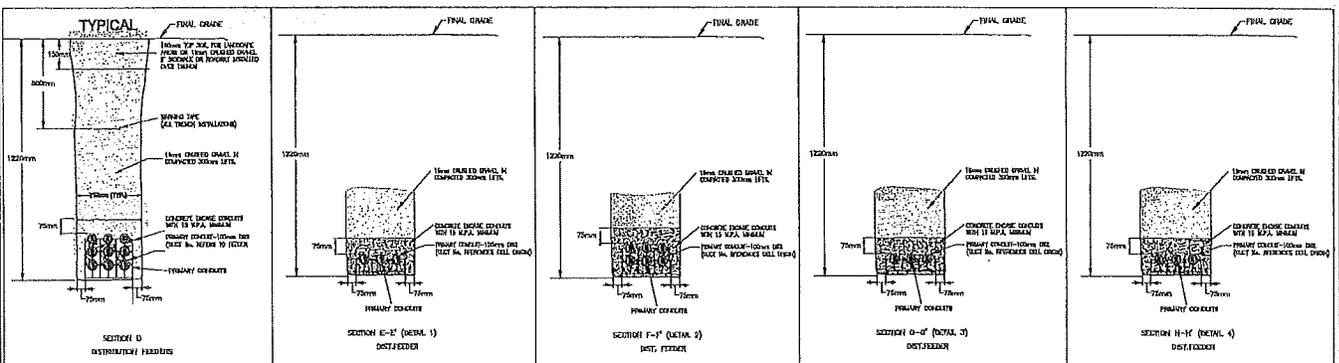
Subject Parcel  
1,802 acres  
Assessment: \$83,500

1:1,200

0' 25' 50' 75' 100'

The City of Grand Forks makes every effort to ensure this map is free of errors but cannot guarantee accuracy or fitness for any purpose, and does not provide warranty of any kind. The City accepts no liability for any expenses, losses, damages and costs relating to use of this map or data. Data must not be used for direct marketing or be used in breach of the privacy laws.



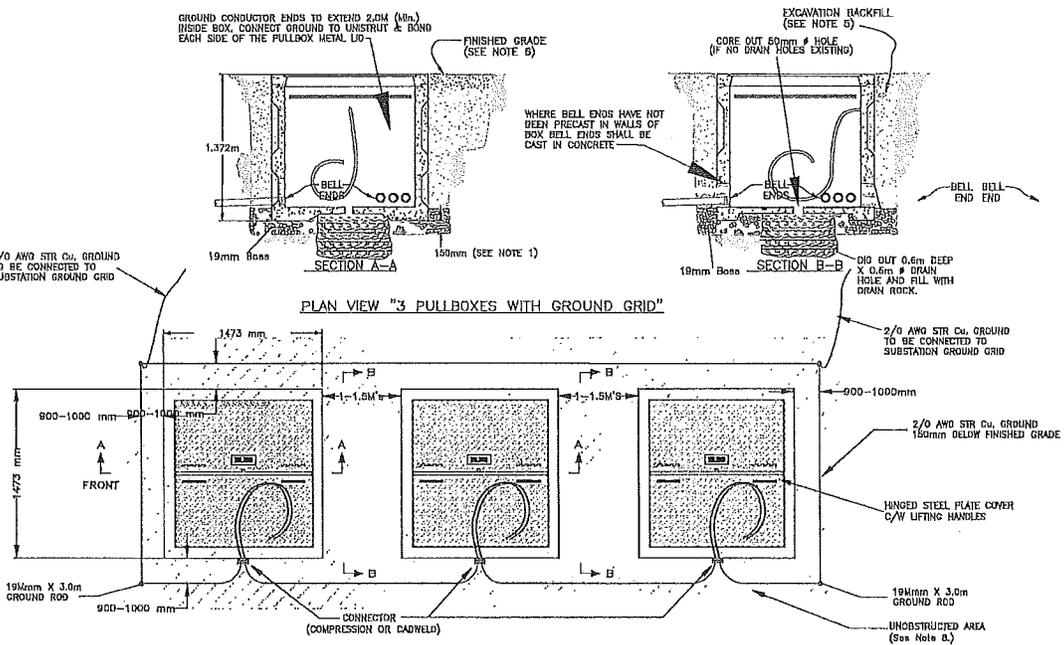


**TRENCH BACKFILL CROSS SECTION DETAILS**

- NOTES:**
1. TRENCH BACKFILLED AND COMPACTED TO 95% OPTIMUM DRY DENSITY.
  2. PULL STRING TO BE INSTALLED IN ALL DUCTS (DCH SPEC 108-0410 R2 - UCM #8 HYDRO TWIST)
  3. DUCT SPACERS TO BE INSTALLED EVERY 2m

- DUCT LEGEND:**
- ① FEEDER F1 (100mm Ø62)
  - ② FEEDER F2 (100mm Ø62)
  - ③ FEEDER F3 (100mm Ø62)

## PULLBOX / VAULT INSTALLATION DETAIL



- NOTES:**
1. ESTABLISH LEVEL BASE WITH 19mm MINUS AND ADJUST TOP OF LID TO MATCH FINISHED GRADE.
  2. BREAK OUT KNOCK OUTS AS REQUIRED AND INSTALL THE CONDUIT AS SHOWN.
  3. INSTALL GROUNDING CONNECTOR AND GROUND RODS AS SHOWN.
  4. INSTALL DRAIN HOLE IN BASE OF VAULT OVER HOLE DUG OUT AND FILLED WITH DRAIN ROCK (as shown).
  5. BACK FILL THE EXCAVATION AND COMPACT THE BACKFILL MATERIAL AS REQUIRED IN SPECIFICATIONS.
  6. RESTORE THE SURFACE AT FINISHED GRADE AS REQUIRED IN SPECIFICATIONS.
  7. GRAND FORMS WILL SPECIFY ORIENTATION OF LIDS TO ALLOW FOR SAFE OPERATING POSITION FOR CREWS.
  8. THE DIMENSIONS OF THE UNOBSTRUCTED AREA ARE MINIMUM CLEARANCES. ANY VEGETATION ON THIS AREA MUST BE OF THE TYPE THAT CAN BE TRIMMED ANNUALLY TO MAINTAIN CLEARANCES. THE UNOBSTRUCTED AREA ALLOWS ACCESS FOR OPERATING PERSONNEL.
  9. PULL STRINGS TO BE INSTALLED IN ALL DUCTS (MGN #8 HYDRO TINE - BCH SPEC 108-0420 R2)

**ACCEPTABLE PRODUCTS**  
 KON CAST PRODUCTS LTD., KELLOWNA  
 50'X80' VAULT DWO'S #1021PEN & #1022PEN  
 A.E. CONCRETE PRECAST PRODUCTS LTD., SURREY  
 60'X60' VAULT & CONC. NECK WITH LID (STEEL)

**CITY OF GRAND FORKS-63 KV SUBSTATION COST ESTIMATE (W/ E-HOUSE)**

Line Item	Description	Vendor and/or Estimate Details	Date	Unit	Quantity	Unit Cost	Cost	ALT. LOCATION 1 6845 2nd St.	ALT. LOCATION 2 6820 1st St.
<b>PROPERTY</b>									
1	Property Acquisition	General area of the existing Ruckles Substation		allowance	1	\$77,400	\$77,400	\$77,400	\$83,500
<b>ENGINEERING/DESIGN</b>									
4	Electrical Engineering (Includes Civil/Structural Engineering)	Estimate Based on Previous Projects		lot	1	\$260,000	\$260,000		
5	Geo-Technical Engineering	Per SNT Engineering	April 5, 2017	lot	1	\$15,000	\$15,000		
6	Fault Analysis & Arc Flash Study	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$5,200	\$5,200		
7	Ground Testing/Fall of Potential Testing	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$1,250	\$1,250		
8	Project Management Includes Expenses	Estimate Based on Previous Projects		Weeks	28	\$3,750	\$105,000		
							Subtotal		
							\$386,450		
<b>SITE PREPARATION</b>									
11	Mass Excavation & Disposal of Existing Fills	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	3450	\$15	\$51,750		
12	Granular Fill & Compacting to 100% SPD @ Max. 300mm Lifts. This also includes additional fill per 200 Year Flood Plain Zone.	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	3000	\$60	\$180,000		
13	Drainage-Includes Engineered Design, Excavation, Supply & Installation c/w Connections from TX Oil/Water Separator at the Containment Install	Estimate Based on Previous Projects		lot	1	\$30,000	\$30,000		
14	Substation Final Grade or Surface Crushed Rock (40m x 30m x 150mm)	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	180	\$100	\$18,000		
							Subtotal		
							\$279,750		
<b>GROUND GRID &amp; SECURITY FENCE INSTALLATIONS</b>									
17	Ground Grid, Fence Structure & Equipment Grounding Components	Per Anixter Power Solutions	April 13, 2017	lot	1	\$49,810	\$49,810		
18	Ground Grid (Installation of Includes Fence & Structure Grounding)	Estimate Based on Previous Projects		Days	5	\$1,600	\$8,000		
19	Security Fence (1 Man Gate and 2 Truck Access gates.)	Per Rite Way Fencing	April 21, 2017	lot	1	\$30,400	\$30,400		
							Subtotal		
							\$88,210		
<b>CONCRETE FOOTINGS/FOUNDATIONS</b>									
22	Foundations - 63 kV Structures	Estimate Based on Previous Projects		m3	40	\$1,200	\$48,000		
23	Foundations - 15 kV Disconnects, Recloser/Dip Structures	Estimate Based on Previous Projects		m3	3	\$1,200	\$3,600		
24	Foundations - E-Houses	Estimate Based on Previous Projects		m3	15	\$1,200	\$18,000		
25	Transformer & Oil Containment Structure	Estimate Based on Previous Projects		m3	30	\$1,200	\$36,000		
26	Oil Separator C/W Petro Stop	Estimate Based on Previous Projects		ea	1	\$15,000	\$15,000		
							Subtotal		
							\$120,600		
<b>EQUIPMENT (PURCHASE ONLY)</b>									
29	63 kV Substation Structures	Estimate Based on Previous Projects		lot	1	\$75,000	\$75,000		
30	Buses, Conductors, Connectors etc. Primary & Secondary Sides	Estimate Based on Previous Projects		lot	1	\$12,000	\$12,000		
31	63 kV Surge Arresters	Per Anixter Power Solutions	March 24, 2017	ea	3	\$2,000	\$6,000		
32	63 kV Dead Tank, Circuit Breaker	Per Anixter Power Solutions	March 24, 2017	ea	1	\$82,000	\$82,000		
33	63 kV Disconnect Switch - motorized	Per Anixter Power Solutions	March 24, 2017	ea	1	\$19,000	\$19,000		
34	63 kV Disconnect Switch - manual	Per Anixter Power Solutions	March 24, 2017	ea	2	\$13,000	\$26,000		
35	63kV Potential Transformers	Per Anixter Power Solutions	March 24, 2017	ea	3	\$11,500	\$34,500		
36	63kV Current Transformers	Per Anixter Power Solutions	March 24, 2017	ea	3	\$14,000	\$42,000		
37	15 MVA Transformer c/w Arresters & OLTC	Per Partner Technologies Inc.	March 17, 2017	ea	1	\$610,000	\$610,000		
38	15 kV Main Feeder Disconnect Switch, 3P Manually Operated Gang Switch Rated at 2000 Amp Continuous	Per Anixter Power Solutions	April 3, 2017	ea	1	\$6,800	\$6,800		
39	E-House C/W 15 kV, Arc Resist, Walk-in Switchgear, All protection, control & metering equipment, 120/240 VAC & 125VDC Supply's etc.	Per Unit Electrical Engineering (4- 10%)	April 18, 2017	lot	1	\$705,000	\$705,000		
40	Security System/Station Liphling	Estimate Based on Previous Projects		ea	4	\$1500	\$6,000		
							Subtotal		
							\$1,624,300		
<b>STRUCTURE &amp; EQUIPMENT ERECTION/REPLACEMENT</b>									
43	Equipment Rental (Cranes)	Estimate Based on Previous Projects		Days	15	\$2,000	\$30,000		
44	Structure Steel Erection - 63 kV (Misc Labour & Materials)	Estimate Based on Previous Projects		lot	1	\$10,000	\$10,000		
45	15 MVA Transformer c/w Arresters & OLTC	Per Partner Technologies Inc.	March 24, 2017	Days	3	\$2,015	\$6,045		
46	63 kV Dead Tank, Circuit Breaker	Estimate Based on Previous Projects		lot	1	\$3,000	\$3,000		
47	63 kV Disconnect Switches	Estimate Based on Previous Projects		lot	3	\$3,000	\$9,000		
48	63kV Potential & Current Transformers	Estimate Based on Previous Projects		lot	6	\$1,500	\$9,000		
							Subtotal		
							\$67,045		
<b>EQUIPMENT TESTING &amp; COMMISSIONING</b>									
51	Complete Equipment Testing & Commissioning	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$55,000	\$55,000		
52	Transformer Testing	Per Partner Technologies Inc.	March 24, 2017	Days	2	\$2,015	\$4,030		
53	Transformer Oil Processing and Filling	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$57,000	\$57,000		
							Subtotal		
							\$116,030		
<b>CONDUIT/5KV CABLING/TERMINATIONS (SUPPLY &amp; INSTALLATION)</b>									
	All labor, equipment & materials for 15kV Underground Concrete Encased Conduit c/w Cables, Terminals etc. for 3 Feeder & 1 Empty Dial Stub for Future.	See attached separate estimates based on each substation location	July 31, 2017	Lot	1	\$133,284	\$133,284		
							Subtotal	\$214,948	\$329,998
<b>CONDUIT/CABLES (SUPPLY &amp; INSTALLATION)</b>									
	Control Cable (Supply Only)	Per Texaco	March 16, 2017	lot	1	\$20,000	\$20,000		
	Control Cable (Installation, Terminating, Topping, Commissioning etc.)	Estimate Based on Previous Projects		Days	6	\$2,400	\$14,400		
							Subtotal		
							\$34,400		
<b>PORTS/IN-INTERCONNECTION</b>									
62	Inter-Utility Protective Relaying Equipment (SEL-421)	Per SEL, Inc.	March 24, 2017	allowance	1	\$10,500	\$10,500		
63	Inter-Utility Protective Relaying Installation/Coordination w/ FortisBC			allowance	1	\$10,000	\$10,000		
65	63 kV Line Extension/Top Structures/Disconnect etc. (FortisBC)			allowance	1	\$120,000	\$120,000		
							Subtotal		
							\$140,500		
67	Sub-Total Substation (Before Tax)						\$3,067,969	\$3,149,633	\$3,270,783
68	Contingency consideration at 20% due to Supplier and Service Providers quoted being relatively conservative or strictly for budgetary purposes.			20% Of Sub-Total			\$613,594	\$629,927	\$654,157
69	Total Substation (Before Tax)						\$3,681,563	\$3,779,560	\$3,924,940

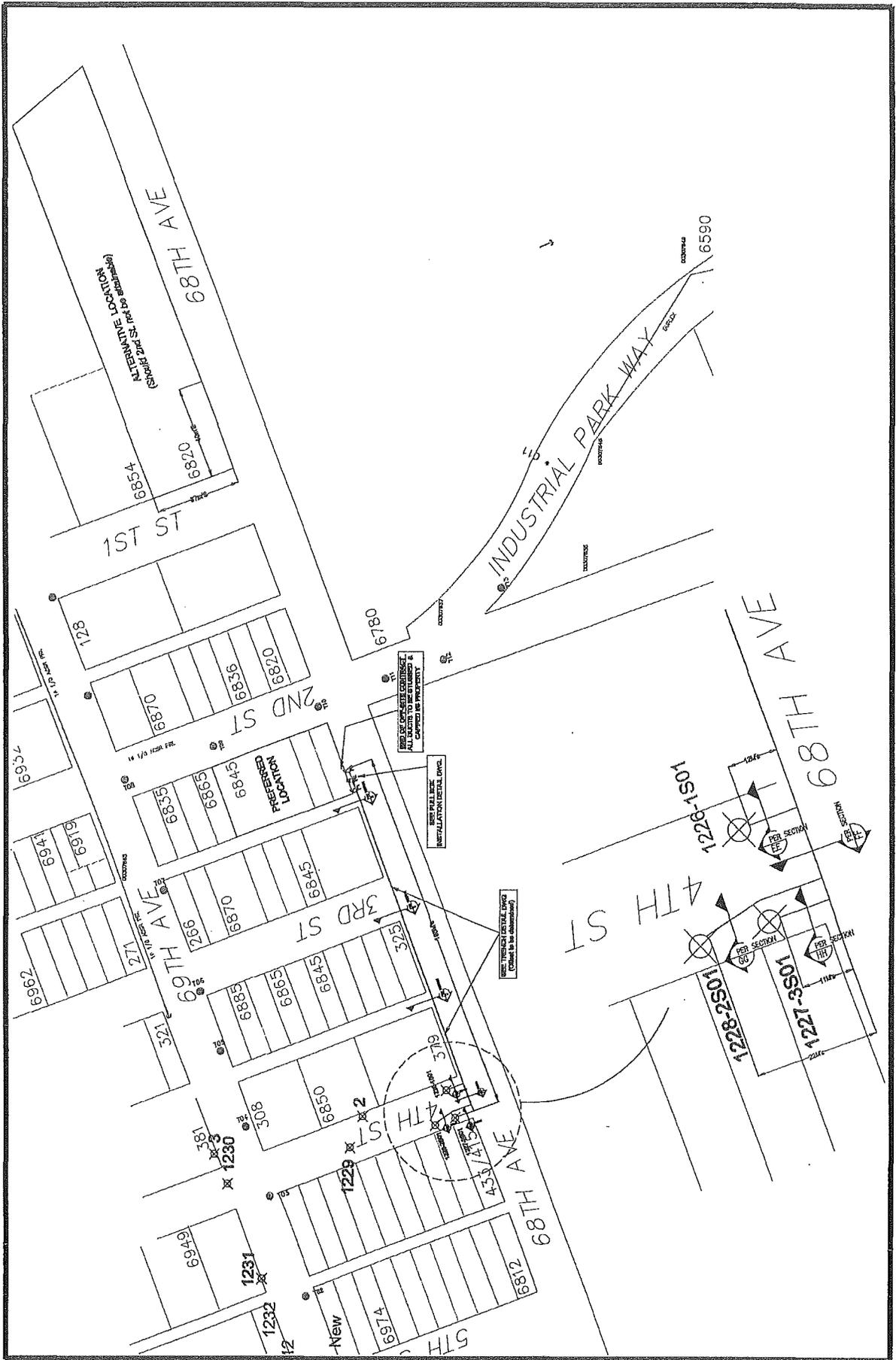
**CITY OF GRAND FORKS-63 KV SUBSTATION COST ESTIMATE (NO E-HOUSE)**

Line Item	Description	Vendor and/or Estimate Details	Date	Unit	Quantity	Unit Cost	Cost	ALT. LOCATION 1 6845 2nd St.	ALT. LOCATION 2 6820 1st St.
<b>PROPERTY</b>									
1	Property Acquisition	General area of the existing Ruckles Substation		allowance	1	\$77,400	\$77,400	\$77,400	\$83,500
<b>ENGINEERING/DESIGN</b>									
3	Electrical Engineering (Includes Civil/Structural Engineering)	Estimate Based on Previous Projects		lot	1	\$260,000	\$260,000		
4	Geo-Technical Engineering	Per SNT Engineering	April 5, 2017	lot	1	\$15,000	\$15,000		
5	Feasibility & Amp Flash Study	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$5,200	\$5,200		
6	Ground Testing/Fall of Potential Testing	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$1,250	\$1,250		
7	Project Management Includes Expenses	Estimate Based on Previous Projects		Weeks	28	\$3,750	\$105,000		
9							Subtotal		
10							\$386,450		
<b>SITE PREPARATION (Installation Courtyed)</b>									
11	Mass Excavation & Disposal of Existing Fills	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	3450	\$15	\$51,750		
12	Granular Fill & Compacting to 100% SPD @ Max. 300mm Lifts. This also includes additional fill per 200 Year Flood Plain Zone.	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	3000	\$60	\$180,000		
13	Drainage-Includes Engineered Design, Excavation, Supply & Installation c/w Connections from TX Oil/Water Separator at the Containment Install.	Estimate Based on Previous Projects		lot	1	\$30,000	\$30,000		
14	Substation Final Grade or Surface Crushed Rock (40m x 30m x 150mm)	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	180	\$100	\$18,000		
15							Subtotal		
16							\$279,750		
<b>GROUND GRID &amp; SECURITY FENCE INSTALLATIONS</b>									
17	Ground Grid (#0 Stranded Bare Cu. & All Components)	Per Anixter Power Solutions	April 13, 2017	lot	1	\$49,810	\$49,810		
18	Ground Grid (Installation of-Includes Fence & Structure Grounding)	Estimate Based on Previous Projects		Days	5	\$1,600	\$8,000		
19	Security Fence (1 Man Gate and 2 Truck Access gates.)	Per Kite Way Fencing	April 21, 2017	lot	1	\$30,400	\$30,400		
20							Subtotal		
21							\$88,210		
<b>EQUIPMENT FOUNDATIONS</b>									
22	Foundations - 63 kV Structures	Estimate Based on Previous Projects		m3	20	\$1,200	\$24,000		
23	Foundations - 15 kV Disconnects, Reclosers/Dip Structures	Estimate Based on Previous Projects		m3	10	\$1,200	\$12,000		
24	Transformer & Oil Containment Structure	Estimate Based on Previous Projects		m3	30	\$1,200	\$36,000		
25	Oil Separator C/W Poin Stop	Estimate Based on Previous Projects		ea	1	\$15,000	\$15,000		
26							Subtotal		
27							\$87,000		
<b>EQUIPMENT</b>									
28	63 kV Substation Structures	Estimate Based on Previous Projects		lot	1	\$70,000	\$70,000		
29	Buses, Conductors, Connectors etc. Primary & Secondary Slides	Estimate Based on Previous Projects		lot	1	\$12,000	\$12,000		
30	63 kV Surge Arresters	Per Anixter Power Solutions	March 24, 2017	ea	3	\$2,000	\$6,000		
31	63 kV Dead Tank, Circuit Breaker	Per Anixter Power Solutions	March 24, 2017	ea	1	\$82,000	\$82,000		
32	63 kV Disconnect Switch - motorized	Per Anixter Power Solutions	March 24, 2017	ea	1	\$19,000	\$19,000		
33	63 kV Disconnect Switch - manual	Per Anixter Power Solutions	March 24, 2017	ea	2	\$13,000	\$26,000		
34	63kV Potential Transformers	Per Anixter Power Solutions	March 24, 2017	ea	3	\$11,500	\$34,500		
35	63kV Current Transformers	Per Anixter Power Solutions	March 24, 2017	ea	3	\$11,500	\$34,500		
36	15 MVA Transformer c/w Arresters & OLTC	Per Partner Technologies Inc.	March 17, 2017	ea	1	\$610,000	\$610,000		
37	15 kV Substation Structures	Estimate Based on Previous Projects		lot	1	\$35,000	\$35,000		
38	15 kV, Reclosers, C/W SEL Protective Relaying/Controls, All Accessories and Adjustable Structure for Substation Installation & Mounting.	Per Anixter Power Solutions	March 29, 2017	ea	4	\$32,250	\$129,000		
39	15 kV, Recloser & Feeder Cable Isolation Disconnects 1200 Amp Solid Blade, Manual Operation by Hook Slick.	Per Anixter Power Solutions	April 3, 2017	ea	12	\$760	\$9,120		
40	15 kV, Main Feeder Disconnect Switch. 3P Manually Operated Gang Switch Rated at 2000 Amp Continuous.	Per Anixter Power Solutions	April 3, 2017	ea	5	\$6,800	\$34,000		
41	15kV Potential Transformers & Cutouts	Estimate Based on Previous Projects	March 24, 2017	ea	3	\$2,200	\$6,600		
42	Protective Relaying (15 MVA Transformer) SEL-487E	Per SEL Inc.	March 24, 2017	lot	1	\$10,500	\$10,500		
43	Protective Relaying (63 kV Breaker) SEL-421	Per SEL Inc.	March 24, 2017	lot	1	\$10,500	\$10,500		
44	Security System/Station Lighting	Estimate Based on Previous Projects		lot	4	\$2,000	\$8,000		
45	Station Service (U/G from TX. On Grand Forks Dist. System and installed in conjunction with U/G Distribution Feeders)	Estimate Based on Previous Projects		lot	1	\$4,000	\$4,000		
46	Control Building c/w Protection & Control System Racks/Cabinets, AC & DC Supply Systems, Mimic Board etc.	Per Unit Electrical Engineering	April 18, 2017	ea	1	\$240,000	\$240,000		
47							Subtotal		
48							\$1,380,720		
<b>STRUCTURE ERECTION</b>									
49	Equipment Rental (Cranes)	Estimate Based on Previous Projects		Days	15	\$2,000	\$30,000		
50	Structure & Equipment Erection/Placement - 63 kV Arresters, Disconnects Breaker, PTs, CTs etc.	Estimate Based on Previous Projects		lot	1	\$75,000	\$75,000		
51	15 kV Structures, Disconnects, Reclosers Placement & Assembly	Estimate Based on Previous Projects		lot	1	\$35,000	\$35,000		
52							Subtotal		
53							\$140,000		
<b>EQUIPMENT TESTING &amp; COMMISSIONING</b>									
54	Complete Equipment Testing & Commissioning	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$55,000	\$55,000		
55	Transformer Testing	Per Partner Technologies Inc.	March 24, 2017	Days	3	\$2,015	\$6,045		
56	Transformer Oil Processing and Filling	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$57,000	\$57,000		
57							Subtotal		
58							\$118,045		
<b>CONDUIT/15KV CABLING/TERMINATIONS (SUPPLY &amp; INSTALLATION)</b>									
59	All labor, equipment & materials for 15kV Underground Concrete Encased Conduit c/w Cables, Terminations etc. for 3 Feeder & 1 Empty Duct Stub for Future.	See attached separate estimate based on substation location adjacent to Fortis Substation	July 31, 2017	Lot	1	\$133,284	\$133,284		
60							Subtotal	\$214,948	\$329,998
60							\$133,284		
<b>CONTROL CABLES (SUPPLY &amp; INSTALLATION)</b>									
61	Control Cable (Supply Only)	Per Texcan	March 16, 2017	lot	1	\$20,000	\$20,000		
62	Control Cable (Installation, Terminating, Tagging, Commissioning etc.)	Estimate Based on Previous Projects		Days	6	\$2,400	\$14,400		
63							Subtotal		
64							\$34,400		
<b>FORTISBC INTERCONNECTION</b>									
65	Inter-Utility Protective Relaying Installation/Coordination w/ FortisBC	Estimated		allowance	1	\$10,000	\$10,000		
67	63 kV Line Extension/Top Structures/Disconnect etc. (FortisBC)	Estimated		allowance	1	\$120,000	\$120,000		
68							Subtotal		
69							\$130,000		
69	Sub-Total Substation (Before Tax)						\$2,855,259	\$2,936,923	\$3,059,073
70	Contingency consideration at 20% due to Supplier and Service Providers quotes being relatively conservative or strictly for budgetary purposes.				20% Of Sub-Total		\$571,052	\$587,385	\$611,615
71	Total Substation (Before Tax)						\$3,426,311	\$3,524,308	\$3,669,688

UNDERGROUND FEEDER INSTALLATION ESTIMATE BASED ON LOCATION ADJACENT TO FORTIS SUBSTATION							
2	Trenching, Conduit Installation, Concrete Encasement, Backfilling/Restoration & Cable Installation Only (No Terminations) for 3 x 15kV Feeders (3 Conduits Per Feeder)	Metres	125	\$438.00		\$54,750.00	
FEEDER 1							
4	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing)	Feet	1100	\$1.68	\$1,846.63
5	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08
6	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46
7	Coupling	(Pricing Per E.B. Horsman)		Each	20	\$2.45	\$49.04
8	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01
9	Duct Spacer Bases	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing)	Pkg.	60	\$3.48	\$209.04
10	Duct Risers (FRB or RPVC)	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05
11	Misc. Materials i.e.Pole Stand-off Brackets, Tenninations (Both Ends) Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00
12	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast Cost of all 3 Units+\$950 added to this item	(Shipping)	ea	1	\$3,620.00	\$3,620.00
13	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00
14	MV Distribution Feeder Cable (350MCM Aluminium)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes)	Metres	300	\$18.12	\$5,436.00
15	MV Distribution Feeder Cable (250MCM Aluminium)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes)	Metres	0	\$14.97	\$0.00
FEEDER 2							
17	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing)	Feet	1100	\$1.68	\$1,846.63
18	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08
19	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46
20	Duct Spacers-Intermediate	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing)	Each	60	\$3.30	\$197.76
21	Duct Risers (FRE or RPVC)	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05
22	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01
23	Misc. Materials i.e.Pole Stand-off Brackets, Terminations (Both Ends) Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00
24	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast		ea	1	\$3,620.00	\$3,620.00
25	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00
26	MV Distribution Feeder Cable (350MCM Aluminium)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes)	Metres	360	\$18.12	\$6,523.20
27	MV Distribution Feeder Cable (250MCM Aluminium)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes)	Metres	0	\$14.97	\$0.00
FEEDER 3							
29	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing)	Feet	1100	\$1.68	\$1,846.63
30	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08
31	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46
32	Duct Spacers-Intermediate	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing)	Each	60	\$3.30	\$197.76
33	Duct Risers (FRE or RPVC)	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05
34	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01
35	Misc. Materials i.e.Pole Stand-off Brackets, Terminations (Both Ends) Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00
36	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast		ea	1	\$3,620.00	\$3,620.00
37	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00
38	MV Distribution Feeder Cable (350MCM Aluminium)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes)	Metres	330	\$18.12	\$5,979.60
39	MV Distribution Feeder Cable (250MCM Aluminium)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes)	Metres	0	\$14.97	\$0.00
VAULT/GROUNDING							
41	4/0 Stranded Bare Ground Wire			Metres	30	\$12.57	\$377.10
42	Ground Rods			Each	4	\$30.00	\$120.00
43	Ground Rod Connectors			Each	4	\$58.00	\$232.00
44	Compression Connectors			Each	3	\$18.50	\$55.50
45	Labor			Hours	4	\$150.00	\$600.00
46						Sub-Total	\$121,167.68
47				10%		Contingency	\$12,116.77
48						Total	\$133,284.44

UNDERGROUND FEEDER INSTALLATION ESTIMATE FROM THE ALTERNATIVE LOCATION OF 6845 2nd St.									
1	Trenching, Conduit Installation, Concrete Encasement, Backfilling/Restoration & Cable Installation Only (No Terminations) for 3 x 15kV Feeders (3 Conduits Per Feeder)					Metres	210	\$438.00	\$91,980.00
3	FEEDER 1								
4	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing	Feet	2700	\$1.68	\$4,532.63		
5	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08		
6	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46		
7	Coupling	(Pricing Per E.B. Horsman)		Each	20	\$2.45	\$49.04		
8	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01		
9	Duct Spacer Bases	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing	Pkg.	120	\$3.48	\$418.08		
10	Duct Risers (FRB or RPVC)	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05		
11	Misc. Materials i.e. Terminations, Pole Stand-off Brackets, Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00		
12	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast (Shipping Cost of all 3 Units + \$950 added to this item)		ea	1	\$3,620.00	\$3,620.00		
13	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00		
14	MV Distribution Feeder Cable (350MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes	Metres	850	\$18.12	\$15,402.00		
15	MV Distribution Feeder Cable (250MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes	Metres	0	\$14.97	\$0.00		
16	FEEDER 2								
17	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing	Feet	2400	\$1.68	\$4,029.00		
18	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08		
19	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46		
20	Duct Spacers-Intermediate	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing	Each	120	\$3.30	\$395.52		
21	Duct Risers (FRB or RPVC)	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05		
22	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01		
23	Misc. Materials i.e. Terminations, Pole Stand-off Brackets, Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00		
24	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast		ea	1	\$3,620.00	\$3,620.00		
25	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00		
26	MV Distribution Feeder Cable (350MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes	Metres	900	\$18.12	\$16,308.00		
27	MV Distribution Feeder Cable (250MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes	Metres	0	\$14.97	\$0.00		
28	FEEDER 3								
29	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing	Feet	2400	\$1.68	\$4,029.00		
30	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08		
31	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46		
32	Duct Spacers-Intermediate	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing	Each	120	\$3.30	\$395.52		
33	Duct Risers (FRB or RPVC)	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05		
34	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01		
35	Misc. Materials i.e. Terminations, Pole Stand-off Brackets, Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00		
36	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast		ea	1	\$3,620.00	\$3,620.00		
37	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00		
38	MV Distribution Feeder Cable (350MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes	Metres	860	\$18.12	\$15,583.20		
39	MV Distribution Feeder Cable (250MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes	Metres	0	\$14.97	\$0.00		
40	VAULT GROUNDING								
41	4/0 Stranded Bare Ground Wire			Metres	30	\$12.57	\$377.10		
42	Ground Rods			Each	4	\$30.00	\$120.00		
43	Ground Rod Connectors			Each	4	\$58.00	\$232.00		
44	Compression Connectors			Each	3	\$18.50	\$55.50		
45	Labor			Hours	4	\$150.00	\$600.00		
46						Sub-Total	\$195,407.39		
47				10%		Contingency	\$19,540.74		
48						Total	\$214,948.12		

UNDERGROUND FEEDER INSTALLATION ESTIMATE FROM THE ALTERNATIVE LOCATION OF 6820 1st St.							
1	Trenching, Conduit Installation, Concrete Encasement, Backfilling/Restoration & Cable Installation Only (No Terminations) for 3 x 15kV Feeders (3 Conduits Per Feeder)			Metres	380	\$438.00	\$166,440.00
FEEDER 1							
4	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing)	Feet	3700	\$1.68	\$6,211.38
5	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08
6	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46
7	Coupling	(Pricing Per E.B. Horsman)		Each	20	\$2.45	\$49.04
8	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01
9	Duct Spacer Bases	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing)	Pkg.	180	\$3.48	\$627.12
10	Duct Risers (FRB or RPVC),	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05
11	Misc. Materials i.e. Terminations, Pole Stand-off Brackets, Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00
12	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast (Shipping Cost of all 3 Units+\$950 added to this item)		ea	1	\$3,620.00	\$3,620.00
13	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00
14	MV Distribution Feeder Cable (350MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed B-House location)	(Includes)	Metres	1280	\$18.12	\$23,193.60
15	MV Distribution Feeder Cable (250MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed E-House location)	(Includes)	Metres	0	\$14.97	\$0.00
FEEDER 2							
17	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing)	Feet	4000	\$1.68	\$6,715.00
18	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08
19	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46
20	Duct Spacers-Intermediate	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing)	Each	180	\$3.30	\$593.28
21	Duct Risers (FRB or RPVC),	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05
22	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01
23	Misc. Materials i.e. Terminations, Pole Stand-off Brackets, Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00
24	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast		ea	1	\$3,600.00	\$3,600.00
25	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00
26	MV Distribution Feeder Cable (350MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed B-House location)	(Includes)	Metres	1300	\$18.12	\$23,556.00
27	MV Distribution Feeder Cable (250MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed B-House location)	(Includes)	Metres	0	\$14.97	\$0.00
FEEDER 3							
29	Conduit	Measured from CAD Dwg. + 15% Per E.B. Horsman	(Pricing)	Feet	3800	\$1.68	\$6,379.25
30	Long Sweep DB2 Bends	(Pricing Per E.B. Horsman)		Each	12	\$31.84	\$382.08
31	Bell Ends	(Pricing Per E.B. Horsman)		Each	10	\$4.95	\$49.46
32	Duct Spacers-Intermediate	Every 2M's (Standard Package 60) Per E.B. Horsman	(Pricing)	Each	180	\$3.30	\$593.28
33	Duct Risers (FRB or RPVC),	(Pricing Per E.B. Horsman)		Feet	100	\$5.68	\$568.05
34	DB2 nto RPVC Conduit to Duct Adapter	(Pricing Per E.B. Horsman)		Each	3	\$4.67	\$14.01
35	Misc. Materials i.e. Terminations, Pole Stand-off Brackets, Labor, Equipment etc.			Unit	1	\$7,500.00	\$7,500.00
36	Supply Pull Box c/w Lid (54" x 54") (Required due to size of Feeder Cable & Number of Duct Bends)	Per Kon-Kast		ea	1	\$3,620.00	\$3,620.00
37	Install Pull Boxes (54" x 54")			Unit	1	\$1,500.00	\$1,500.00
38	MV Distribution Feeder Cable (350MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed B-House location)	(Includes)	Metres	1290	\$18.12	\$23,374.80
39	MV Distribution Feeder Cable (250MCM Aluminum)	Measured from CAD Dwg. + 15%. Terminal Pole to proposed B-House location)	(Includes)	Metres	0	\$14.97	\$0.00
VAULT GROUNDING							
41	4/0 Stranded Bare Ground Wire			Metres	30	\$12.57	\$377.10
42	Ground Rods			Each	4	\$30.00	\$120.00
43	Ground Rod Connectors			Each	4	\$58.00	\$232.00
44	Compression Connectors			Each	3	\$18.50	\$55.50
45	Labor			Hours	4	\$150.00	\$600.00
46						Sub-Total	\$299,998.15
47				10%		Contingency	\$29,999.81
48						Total	\$329,997.96



**Prospective 15MVA-63/12 4kV Substation Build  
City of Grand Forks Electric Utility  
Grand Forks, BC Canada**

*All drawings, details, estimates etc. contained within this document are to be considered for informative and estimating purposes only and are non-binding to any and all parties named.*

*Completed in  
Partnership:  
T.E. Burns  
Engineering Ltd. &  
T. Andreychuk  
Consulting Ltd.  
May 2017*

# City of Grand Forks Electric Utility 15MVA, 63-12.4kV Substation

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## Scope of Consultant(s) Engagement

T. Andreychuk Consulting Ltd. and T.E. Burns Engineering Ltd. were engaged to provide detailed documents, estimates and drawings relating to potential and/or foreseeable costs associated with the design and construction of a 15MVA 63/12.4kV Substation for The City of Grand Forks Electric Utility (GFE).

Consultants as named shall provide the Services and subsequent Deliverables as related to Budgetary Estimates, Documents and Drawings which shall be accumulated, detailed and tallied for the following:

- 1) Initial communications and discussions with Client to aid in determination of expectations.
- 2) Substation Location and Property Acquisition
- 3) Design Engineering
- 4) Geo-Tech Site Analysis (*Preliminary & Throughout Site Preparations*)
- 5) Environmental Assessment of Selected Site (*Site Dependant*)
- 6) Project Management (*Term of Project*)
- 7) Demolition (*If applicable to identified site.*)
- 8) Flood Plain Remedy in conjunction w/ Substation Site Civil Preparations (*Site Dependant*)
- 9) FortisBC Transmission Line Extension Costs to be estimated based on resulting Substation Location.
- 10) Current Material Supply Cost Estimates for the Substation Components.

Substation components include but are not limited to the following:

- a) 15MVA 63/12.4kV Substation Transformer
- b) 69kV PT's/CT's
- c) 69kV SF6 Breaker
- d) 69kV Motor Operated Disconnects
- e) 69kV Manually Operated Breaker Disconnects
- f) 15kV Reclosers c/w Controls, Protection & Metering Class CT's
- g) 15kV Manually Operated Disconnects
- h) 15kV PT's/CT's
- i) Structural Steel
- j) Concrete Works, Oil Containment etc.
- k) E-House/Control Building to house: M/C, A/R Switchgear, Battery Bank, Protection & Controls, Remote Operations, Work Station etc.

- l) Control Building to house Battery Bank, Protection & Controls, Remote Operations, Work Station etc.
  - m) Protection, Relaying & Controls
  - n) U/G Concrete Encased Distribution Feeder Ducts, Cable & Terminations
  - o) Ground Grid
  - p) Substation Security (i.e. Fencing)
  - q) Substation Testing & Commissioning
- 9) Develop Single Line Diagram, Protection Scheme & Station Profile/Side View .
- 11) Construction Costs
- 12) Develop Draft Copy for Client review and comment.
- 13) Develop final copy based on Item 12 and in consultation with T.E. Burns Engineering Ltd. in order to acquire sealed project overview.

### **Project Assumptions**

- A. The Substation as proposed in this document is intended to replace the existing Grand Forks-Ruckles Distribution Substation currently supplied by FortisBC supplying Distribution Voltages of 4.16 kV for Feeders F1 & F2 and 12.4 kV for Feeder F3.
- B. The Substation build site will be located in the general vicinity of the existing Ruckles Substation.
- C. Per preceding Item B. No Allowances have been included in this estimate for existing GFE Distribution Feeder Re-configuration and/or Re-Routing. Should the substation build site be contemplated at an alternate location due to property being unattainable in the general area, it is recommended that an in-depth analysis and cost study be performed to determine the most cost effective location as the investment to Re-configure and Re-Route the Feeders could potentially be in the area of \$300,000 to \$600,000.
- D. Prior to the New Substation being completed, GFE shall complete all Distribution System Upgrades relative to the Voltage Conversion (*4.16kV to 12.4kV*) of Feeders F1 and F2 currently supplied out of Ruckles Substation.  
(*The New Substation per this document shall supply 12.4kV only*)

### **General Information for Consideration**

- A. Current Grand Forks System Peak Load is 9MVA in 2008, therefore with a 15MVA Substation there is room for considerable load growth/development in the community.
- B. Inclusive to this document is the following significant recommendation:

Should GFE build the substation they must contemplate and plan for system redundancy in the relatively near future while a definitive emergency preparedness plan be put in place in conjunction with the substation build & energization so as to ensure security of Customer Power Supply and/or System Restoration in the event of major equipment failure i.e. Substation Transformer or Breaker. It should also be mentioned that historically equipment such as this has an extremely low failure rate but nonetheless it is the Electric Utility's responsibility to ensure Customer Supply Security & Restoration.

Further to the above it should be noted that although current FortisBC Supply Points/Substations do not have equipment for redundant supply options FortisBC do however own at least two (2) Mobile Substations which can be transported to their site(s) in the event of their own Major Equipment Failure.

- C. Should serious consideration be given to GFE building/owning/operating a substation due to the evident economic benefits available to the City of Grand Forks and its Electric Utility, then additional options or considerations of newly developed module-type substation equipment should be investigated that could provide for system redundancy and security in combination with a substation build at either or both FortisBC to GFE Supply Points.

## **Substation Characteristics**

- A. Recommended Site Dimensions - 30 x 40 Metres
- B. Transmission/Supply Voltage - 63kV (by FortisBC)
- C. Substation & Transformer Capacity - 15MVA
- D. Distribution Voltage - 12.4 kV
- E. Three (3) Distribution Feeders & One (1) Spare Feeder Bay or Cell  
*(Spare is for Future Load Growth and/or Redundancy of Equipment)*
- F. Two (2) Options or Types of construction for the 12.4kV Substation Distribution Feeder Breaker Arrangement have been evaluated and included:
  - 1) Modular E-House/Control Building c/w:
    - a) Complete Line-up of Indoor 15 kV Class Metal Clad, Arc-Resistant Type 2B Switchgear
    - b) PLC with Relays for switchgear protection and communication
    - c) Battery system with chargers for relay and switchgear control power  
*(Complete Supplier documents provided in Appendices)*
  - 2) Control Building (Only) c/w:
    - a) Outdoor Steel Structure Mounted Reclosers/Breakers
    - b) Weather-Proof PLC/Control Cabinets
    - c) Control Building includes only b) and c) of the previous Item 1).

Although Option 1 is approximately a 7-10% higher in cost, it is the recommended option for the following reasons.

- 1) Switchgear and related equipment are inside out of the elements therefore an extended life cycle of equipment
- 2) Staff are out of the elements during emergency repairs.
- 3) Ease of access for repairs or maintenance
- 4) No bucket trucks, ladders etc. are required for access to equipment
- 5) More compact versus outdoor equipment.
- 6) Improved Safety for workers due to all of the above.
- 7) Aesthetically beneficial versus tall structure mounted equipment.

### **Substation Construction Cost Considerations**

All Substation Civil Works, Equipment, Foundations, Structures etc. shall be designed and constructed to all current Engineering Standards, Rules, Regulations & Codes to ensure the safety of staff and the general public and to assure the City of Grand Forks and their taxpayers protection of any and all investment.

The following factors may or may not come into realization but have a definite influence on costs (+/-) depending on the substation location.

- 1) Demolition of existing buildings or structures.
- 2) Site Environmental Assessment, Advisement & Subsequent Works
- 3) Geo-Technical Assessment Advisement & Subsequent Works
- 4) Site Preparation related to Civil Works
- 5) Current Grand Forks Electric Utility Feeder Reconfiguration or Rerouting.

Although property costs have been included with the estimates, in order to establish a more accurate and substantive substation cost the site would need to be determined as these costs could definitely influence the outcome of a decision.

### **Substation Protection Scheme Explanation:**

The following is additional to the Protection Scheme Drawings:

The protection scheme is based on the industry leading Schweitzer Engineering Laboratories protection relays.

Two design concepts have been presented:

- One with a prefabricated E-House containing all the low voltage switchgear, station service and protective relaying.
- The other with outdoor, structure mounted reclosers complete with outdoor SEL 351R relays for feeder protection and a separate building to contain the other protective relays and back-up power supply.

The protection scheme for both concepts is essentially the same with the exception of the low voltage buss protection (see below).

The high voltage (60kV) entry protection is provided by the SEL 421 Transmission Line relay. This device provides outward looking distance protection, instantaneous and timed overcurrent protection, under/over voltage protection and under/over frequency protection. Depending on the FortisBC requirements for system interface it may be possible to substitute the less expensive SEL 351S as a basic overcurrent protection device.

The Power Transformer protection is provided by the SEL 487 Transformer Differential Protection Relay. This device provides differential protection for the entire transformer zone from the line side of the 60 kV breaker to the low voltage (12.5 kV) terminals of the transformer.

For the E-House design option this device also provides differential protection for the low voltage bus from the low voltage terminals of the transformer to the line side of the main breaker in the E-House. This is possible because of the addition of a main breaker and associated current transformers (CT) available in the E-House option.

For both the E-House design and the Outdoor design the SEL 487 provides lower voltage buss overcurrent protection. In the case of the E-House design the overcurrent protection feature provides back-up protection to the differential protection and in the case of the Outdoor design the overcurrent protection feature acts as the primary buss protection.

The protection associated with the transformer body trips into the SEL 487 relay as well. This includes:

- Transformer and On Load Tap Changer (OLTC) oil level
- Transformer and OLTC pressure relief device
- Oil Temperature
- Winding Temperature
- Buchholz Relay

In both design options the feeder protection is provided by SEL 351 relays. These units provide instantaneous and timed overcurrent protection as well as feeder Open/Close and programmed reclosing functions.

For the Outdoor option this is provided by the SEL 351R which is an outdoor unit specifically designed to use with outdoor, structure mounted reclosers.

For the E-House option this is provided by the SEL 351S which is the indoor panel mount version of the relay.

## List of Appendices:

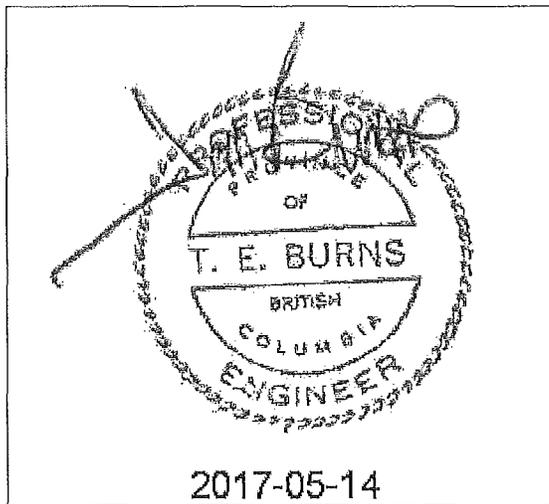
Appendix I: Substation Cost Estimate W/ Control Building Only

Appendix II: Substation Cost Estimate W/ E-House/Control Building

Appendix III: Series 100 E-House Drawings

Appendix IV: Series 101 No E-House Drawings

## Engineer's Seal



# Appendix I:

## Substation Cost Estimate W/ Control Building Only

**CITY OF GRAND FORKS-63 KV SUBSTATION COST ESTIMATE (NO E-HOUSE)**

Line Item	Description	Vendor and/or Estimate Details	Date	Unit	Quantity	Unit Cost	Cost	
<b>PROPERTY</b>								
1	Property Acquisition	General area of the existing Ruckles Substation		allowance	1	\$250,000	\$250,000	
<b>ENGINEERING/DESIGN</b>								
4	Electrical Engineering (Includes Civil/Structural Engineering)	Estimate Based on Previous Projects		lot	1	\$260,000	\$260,000	
5	Geo-Technical Engineering	Per SNT Engineering	April 5, 2017	lot	1	\$15,000	\$15,000	
6	Fault Analysis & Arc Flash Study	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$5,200	\$5,200	
7	Ground Testing/Fall of Potential Testing	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$1,250	\$1,250	
8	Project Management Includes Expenses	Estimate Based on Previous Projects		Weeks	28	\$3,750	\$105,000	
							<b>Subtotal</b>	<b>\$386,450</b>
<b>SITE PREPARATION (Installation Contract)</b>								
11	Mass Excavation & Disposal of Existing Fills	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	3450	\$15	\$51,750	
12	Granular Fill & Compacting to 100%SPD @ Max. 300mm Lifts. This also includes additional fill per 200 Year Flood Plain Zone.	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	3000	\$60	\$180,000	
13	Drainage-Includes Engineered Design, Excavation, Supply & Installation c/w Connections from TX Oil/Water Separator at the Containment Install	Estimate Based on Previous Projects		lot	1	\$30,000	\$30,000	
14	Substation Final Grade or Surface Crushed Rock (40m x 30m x 150mm)	Per Argosy Construction Group Inc.-Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	180	\$100	\$18,000	
							<b>Subtotal</b>	<b>\$279,750</b>
<b>GROUND GRID &amp; SECURITY FENCE INSTALLATIONS</b>								
17	Ground Grid (4/0 Stranded Bars Cu. & All Components)	Per Anixter Power Solutions	April 13, 2017	lot	1	\$49,810	\$49,810	
18	Ground Grid (Installation of-Includes Fence & Structure Grounding)	Estimate Based on Previous Projects		Days	5	\$1,600	\$8,000	
19	Security Fence (1 Man Gate and 2 Truck Access gates.)	Per Rite Way Fencing	April 21, 2017	lot	1	\$30,400	\$30,400	
							<b>Subtotal</b>	<b>\$88,210</b>
<b>EQUIPMENT FOUNDATIONS</b>								
22	Foundations - 63 kV Structures	Estimate Based on Previous Projects		m3	20	\$1,200	\$24,000	
23	Foundations - 15 kV Disconnects, Recloser/Dip Structures	Estimate Based on Previous Projects		m3	10	\$1,200	\$12,000	
24	Transformer & Oil Containment Structure	Estimate Based on Previous Projects		m3	30	\$1,200	\$36,000	
25	Oil Separator C/W Petro Stop	Estimate Based on Previous Projects		ea	1	\$15,000	\$15,000	
							<b>Subtotal</b>	<b>\$87,000</b>
<b>EQUIPMENT</b>								
28	63 kV Substation Structures	Estimate Based on Previous Projects		lot	1	\$70,000	\$70,000	
29	Buses, Conductors, Connectors etc. Primary & Secondary Sides	Estimate Based on Previous Projects		lot	1	\$12,000	\$12,000	
30	63 kV Surge Arresters	Per Anixter Power Solutions	March 24, 2017	ea	3	\$2,000	\$6,000	
31	63 kV Dead Tank, Circuit Breaker	Per Anixter Power Solutions	March 24, 2017	ea	1	\$82,000	\$82,000	
32	63 kV Disconnect Switch - motorized	Per Anixter Power Solutions	March 24, 2017	ea	1	\$19,000	\$19,000	
33	63 kV Disconnect Switch - manual	Per Anixter Power Solutions	March 24, 2017	ea	2	\$13,000	\$26,000	
34	63kV Potential Transformers	Per Anixter Power Solutions	March 24, 2017	ea	3	\$11,500	\$34,500	
35	63KV Current Transformers	Per Anixter Power Solutions	March 24, 2017	ea	3	\$11,500	\$34,500	
36	15 MVA Transformer c/w Arresters & OLTC	Per Partner Technologies Inc.	March 17, 2017	ea	1	\$610,000	\$610,000	
37	15 kV Substation Structures	Estimate Based on Previous Projects		lot	1	\$35,000	\$35,000	
38	15 kV, Reclosers, C/W SEL Protective Relaying/Controls, All Accessories and Adjustable Structure for Substation Installation & Mounting	Per Anixter Power Solutions	March 29, 2017	ea	4	\$32,250	\$129,000	
39	15 kV, Recloser & Feeder Cable Isolation Disconnects 1200 Amp Solid Blade, Manual Operation by Hook. Stick.	Per Anixter Power Solutions	April 3, 2017	ea	12	\$760	\$9,120	
40	15 kV, Main Feeder Disconnect Switch, 3Ø Manually Operated Gang Switch Rated at 2000 Amp Continuous	Per Anixter Power Solutions	April 3, 2017	ea	5	\$6,800	\$34,000	
41	15kV Potential Transformers & Cutouts	Estimate Based on Previous Projects	March 24, 2017	ea	3	\$2,200	\$6,600	
42	Protective Relaying (15 MVA Transformer) SEL-487E	Per SEL Inc.	March 24, 2017	lot	1	\$10500	\$10,500	
43	Protective Relaying (63 kV Breaker) SEL-421	Per SEL Inc.	March 24, 2017	lot	1	\$10500	\$10,500	
44	Security System/Station Lighting	Estimate Based on Previous Projects		lot	4	\$2000	\$8,000	
45	Station Service (U/G from Tx. On Grand Forks Dist. System and installed in conjunction with U/G Distribution Feeders)	Estimate Based on Previous Projects		lot	1	\$4000	\$4,000	
46	Control Building c/w Protection & Control System Racks/Cabinets, AC & DC Supply Systems, Mimic Board etc.	Per Unit Electrical Engineering	April 18, 2017	ea	1	\$240,000	\$240,000	
							<b>Subtotal</b>	<b>\$1,380,720</b>
<b>STRUCTURE ERECTION</b>								
47	Equipment Rental (Cranes)	Estimate Based on Previous Projects		Days	15	\$2,000	\$30,000	
48	Structure & Equipment Erection/Placement - 63 kV Arresters, Disconnects Breaker, PT's, CT's etc.	Estimate Based on Previous Projects		lot	1	\$75,000	\$75,000	
49	15 kV Structures, Disconnects, Reclosers Placement & Assembly	Estimate Based on Previous Projects		lot	1	\$35,000	\$35,000	
							<b>Subtotal</b>	<b>\$140,000</b>
<b>EQUIPMENT TESTING &amp; COMMISSIONING</b>								
53	Complete Equipment Testing & Commissioning	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$55,000	\$55,000	
54	Transformer Testing	Per Partner Technologies Inc.	March 24, 2017	Days	3	\$2,015	\$6,045	
55	Transformer Oil Processing and Filling	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$57,000	\$57,000	
							<b>Subtotal</b>	<b>\$118,045</b>
<b>CONDUIT/ISK CABLING, TERMINATIONS &amp; CONTROL CABLES (SUPPLY &amp; INSTALLATION)</b>								
58	15kV Underground Concrete Encased Conduit c/w Cables for 3 Feeder & 1 Empty Duct Stub for Future	Estimate Based on Previous Projects		Meters	290	\$485	\$140,650	
59	Misc. Materials i.e. Duct Risers (FRE), Terminations, Pole Stand-off Brackets, Labor etc.	Estimate Based on Previous Projects		lot	3	\$7,500	\$22,500	
60	Supply/Install Full Boxes (54" x 54") c/w Grounding (Required due to size of Feeder Cable & Number of Duct Bends)	Estimate Based on Previous Projects		ea	3	\$4,000	\$12,000	
61	Control Cable	Per Texcan	March 16, 2017	lot	1	\$20,000	\$20,000	
62	Control Cable (Installation, Terminating, Tagging, Commissioning etc.)	Estimate Based on Previous Projects		Days	6	\$2,400	\$14,400	
							<b>Subtotal</b>	<b>\$209,550</b>
<b>NORTHSDC INTER CONNECTION</b>								
65	Inter-Utility Protective Relaying Installation/Coordination w/ FortisBC	Estimated		allowance	1	\$10000	\$10,000	
66	63 kV Line Extension/Tap Structures/Disconnect etc. (FortisBC)	Estimated		allowance	1	\$120,000	\$120,000	
							<b>Subtotal</b>	<b>\$130,000</b>
68	<b>Sub-Total Substation (Before Tax)</b>							<b>\$3,084,725</b>
69	Contingency consideration at 20% due to Supplier and Service Providers quotes being relatively conservative or strictly for budgetary purposes.				20% Of Sub-Total		<b>\$616,945</b>	
70	<b>Total Substation (Before Tax)</b>							<b>\$3,701,670</b>

## Appendix II:

### Substation Cost Estimate W/ E-House/Control Building

**CITY OF GRAND FORKS-63 KV SUBSTATION COST ESTIMATE (W/ E-HOUSE )**

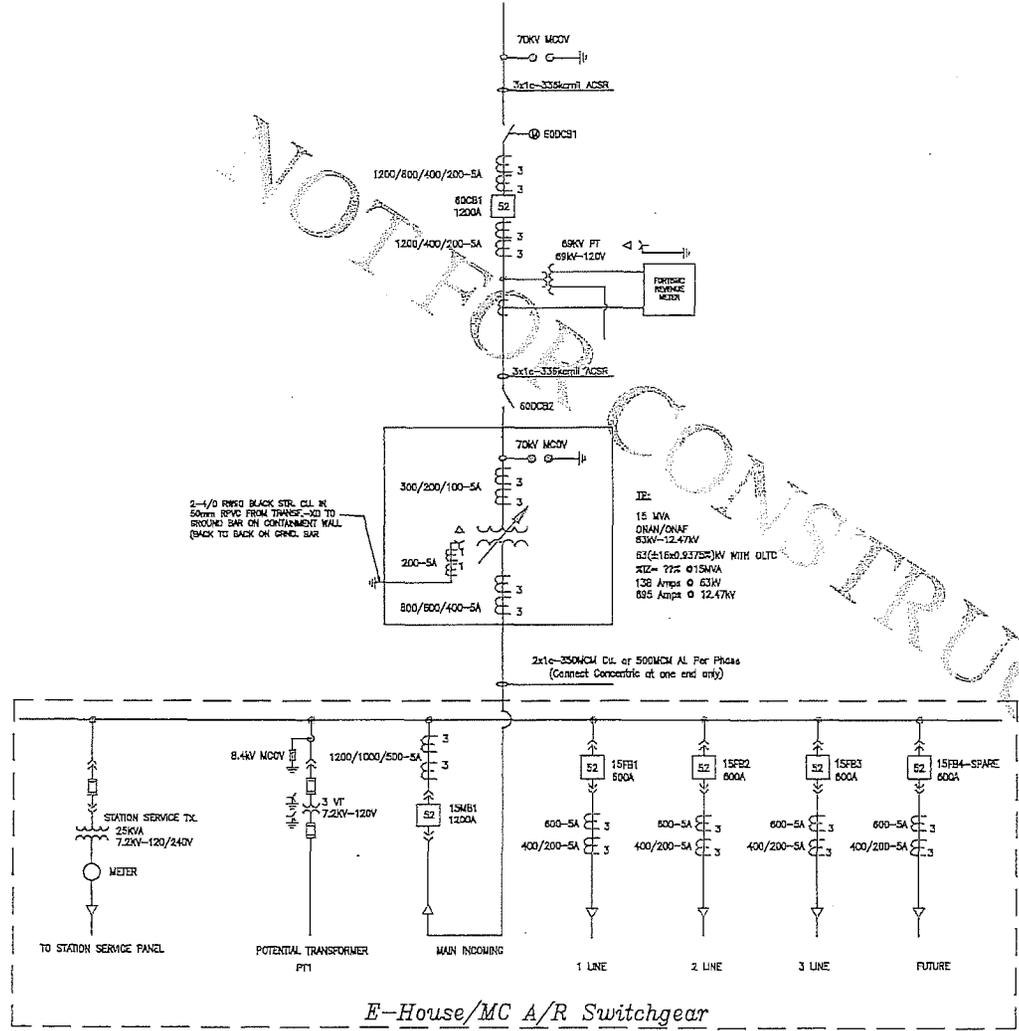
Line Item	Description	Vendor and/or Estimate Details	Date	Unit	Quantity	Unit Cost	Cost
<b>PROPERTY</b>							
1	Property Acquisition	General area of the existing Ruckles Substation		allowance	1	\$250,000	\$250,000
<b>ENGINEERING/DESIGN</b>							
4	Electrical Engineering (Includes Civil/Structural Engineering)	Estimate Based on Previous Projects		lot	1	\$260,000	\$260,000
5	Geo-Technical Engineering	Per SNT Engineering	April 5, 2017	lot	1	\$15,000	\$15,000
6	Fault Analysis & Arc Flash Study	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$5,200	\$5,200
7	Ground Testing/Fall of Potential Testing	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$1,250	\$1,250
8	Project Management Includes Expenses	Estimate Based on Previous Projects		Weeks	28	\$3,750	\$105,000
Subtotal							\$386,450
<b>SITE PREPARATION</b>							
11	Mass Excavation & Disposal of Existing Fills	Per Argosy Construction Group Inc.- Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	3450	\$15	\$51,750
12	Granular Fill & Compacting to 100% SPD @ Max. 300mm Lifts. This also includes additional fill per 200 Year Flood Plain Zone.	Per Argosy Construction Group Inc.- Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	3000	\$60	\$180,000
13	Drainage- Includes Engineered Design, Excavation, Supply & Installation c/w Connections from TX Oil/Water Separator at the Containment Install.	Estimate Based on Previous Projects		lot	1	\$30,000	\$30,000
14	Substation Final Grade or Surface Crushed Rock (40m x 30m x 150mm)	Per Argosy Construction Group Inc.- Grand Forks (Quantities Estimated per SNT Eng.)	April 10, 2017	m3	180	\$100	\$18,000
Subtotal							\$279,750
<b>GROUND GRID &amp; SECURITY FENCE INSTALLATIONS</b>							
17	Ground Grid, Fence, Structure & Equipment Grounding Components	Per Anixter Power Solutions	April 13, 2017	lot	1	\$49,810	\$49,810
18	Ground Grid (Installation of- Includes Fence & Structure Grounding)	Estimate Based on Previous Projects		Days	5	\$1,600	\$8,000
19	Security Fence (1 Man Gate and 2 Truck Access gates.)	Per Rite Way Fencing	April 21, 2017	lot	1	\$30,400	\$30,400
Subtotal							\$88,210
<b>CONCRETE FOOTINGS/FOUNDATIONS</b>							
22	Foundations - 63 kV Structures	Estimate Based on Previous Projects		m3	40	\$1,200	\$48,000
23	Foundations - 15 kV Disconnects, Recloser/Dip Structures	Estimate Based on Previous Projects		m3	3	\$1,200	\$3,600
23	Foundations - E-House	Estimate Based on Previous Projects		m3	15	\$1,200	\$18,000
24	Transformer & Oil Containment Structure	Estimate Based on Previous Projects		m3	30	\$1,200	\$36,000
25	Oil Separator C/W Petro Stop	Estimate Based on Previous Projects		ea	1	\$15,000	\$15,000
Subtotal							\$120,600
<b>EQUIPMENT (PURCHASE ONLY)</b>							
28	63 kV Substation Structures	Estimate Based on Previous Projects		lot	1	\$75,000	\$75,000
29	Buses, Conductors, Connectors etc, Primary & Secondary Sides	Estimate Based on Previous Projects		lot	1	\$12,000	\$12,000
30	63 kV Surge Arresters	Per Anixter Power Solutions	March 24, 2017	ea	3	\$2,000	\$6,000
31	63 kV Dead Tank Circuit Breaker	Per Anixter Power Solutions	March 24, 2017	ea	1	\$82,000	\$82,000
32	63 kV Disconnect Switch - motorized	Per Anixter Power Solutions	March 24, 2017	ea	1	\$19,000	\$19,000
33	63 kV Disconnect Switch - manual	Per Anixter Power Solutions	March 24, 2017	ea	2	\$13,000	\$26,000
34	63kV Potential Transformers	Per Anixter Power Solutions	March 24, 2017	ea	3	\$11,500	\$34,500
35	63kV Current Transformers	Per Anixter Power Solutions	March 24, 2017	ea	3	\$14,000	\$42,000
36	15 MVA Transformer c/w Arresters & OLTC	Per Partner Technologies Inc.	March 17, 2017	ea	1	\$610,000	\$610,000
37	15 kV Main Feeder Disconnect Switch, 3Ø Manually Operated Gang Switch Rated at 2000 Amp Continuous	Per Anixter Power Solutions	April 3, 2017	ea	1	\$6,800	\$6,800
38	E-House C/W 15 kV, Arc Resist, Walk-in Switchgear, All protection, control & metering equipment, 120/240 VAC & 125VDC Supply's etc.	Per Unit Electrical Engineering (+/- 10%)	April 18, 2017	lot	1	\$705,000	\$705,000
39	Security System/Station Lighting	Estimate Based on Previous Projects		ea	4	\$1,500	\$6,000
Subtotal							\$1,624,300
<b>STRUCTURE &amp; EQUIPMENT ERECTION/PLACEMENT</b>							
42	Equipment Rental (Crane)	Estimate Based on Previous Projects		Days	15	\$2,000	\$30,000
43	Structure Steel Erection - 63 kV (Misc Labour & Materials)	Estimate Based on Previous Projects		lot	1	\$10,000	\$10,000
44	15 MVA Transformer c/w Arresters & OLTC	Per Partner Technologies Inc.	March 24, 2017	Days	3	\$2,015	\$6,045
45	63 kV Dead Tank Circuit Breaker	Estimate Based on Previous Projects		lot	1	\$3,000	\$3,000
46	63 kV Disconnect Switches	Estimate Based on Previous Projects		lot	3	\$3,000	\$9,000
47	63kV Potential & Current Transformers	Estimate Based on Previous Projects		lot	6	\$1,500	\$9,000
Subtotal							\$67,045
<b>EQUIPMENT TESTING &amp; COMMISSIONING</b>							
50	Complete Equipment Testing & Commissioning	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$55,000	\$55,000
51	Transformer Testing	Per Partner Technologies Inc.	March 24, 2017	Days	2	\$2,015	\$4,030
52	Transformer Oil Processing and Filling	Per Wismer & Rawlings Electric Ltd.	April 19, 2017	lot	1	\$57,000	\$57,000
Subtotal							\$116,030
<b>CONDUIT/WK/CABLING/TERMINATIONS &amp; CONTROL CABLES</b>							
55	15kV Underground Concrete Encased Conduit c/w Cables for 3 Feeder & 1 Empty Duct Stub for Future	Estimate Based on Previous Projects		Metres	290	\$485	\$140,650
56	Misc. Materials i.e. Duct-Risers (FRE), Terminations, Pole Stand-off Brackets, Labor etc.	Estimate Based on Previous Projects		lot	3	\$7,500	\$22,500
57	Supply/Install Pull Boxes (54" x 54") c/w Grounding to size of Feeder Cable & Number of Duct Bends (Required dup)	Estimate Based on Previous Projects		ea	3	\$4,000	\$12,000
58	Control Cable (Supply Only)	Per Texcan	March 16, 2017	lot	1	\$20,000	\$20,000
59	Control Cables (Installation, Terminating, Tagging, Commissioning etc.)	Estimate Based on Previous Projects		Days	6	\$2,400	\$14,400
Subtotal							\$209,550
<b>FORTISBC INTERCONNECTION</b>							
62	Inter-Utility Protective Relaying Equipment (SEL-421)	Per SEL Inc.	March 24, 2017	allowance	1	\$10,500	\$10,500
63	Inter-Utility Protective Relaying Installation/Coordination w/ FortisBC			allowance	1	\$10,000	\$10,000
64	63 kV Line Extension/ Tap Structures/Disconnect etc. (FortisBC)			allowance	1	\$120,000	\$120,000
Subtotal							\$140,500
66	Sub-Total Substation (Before Tax)						\$3,282,435
67	Contingency consideration at 20% due to Supplier and Service Providers quotes being relatively conservative or strictly for budgetary purposes.			20% Of Sub-Total			\$656,487
68	<b>Total Substation (Before Tax)</b>						<b>\$3,938,922</b>

## Appendix III:

### Series 100 E-House Drawings



FORTISBC O/H LINE 63KV



LEGEND

SYMBOL	DESCRIPTION
[Symbol]	FUSE
[Symbol]	GROUNDING
[Symbol]	CURRENT TRANSFORMER
[Symbol]	POTENTIAL TRANSFORMER
[Symbol]	AC CIRCUIT BREAKER
[Symbol]	FEEDER
[Symbol]	DISCONNECT SWITCH
[Symbol]	LIGHTNING ARRESTER
[Symbol]	SURGE ARRESTER
[Symbol]	DLTC TRANSFORMER

NOT FOR CONSTRUCTION

E-House/MC A/R Switchgear

**City of Grand Forks Electrical Utility**  
 P.O. Box 2228, 222 4th Street, Grand Forks, N.D. 58201  
 Phone (701) 405-2800 Fax (701) 405-2000

**PROPOSED SUBSTATION  
 SINGLE LINE DIAGRAM  
 (OPTION W/ E-HOUSE)**

NO.	DATE	REVISION LIST	BY

Drawn:	TGJ / TWA	Scale:	N/A	Checked:	WJG	Drawn:	WJG
Approved:	TWA	Checked:	12/06/2017	Drawn:	WJG	Drawn:	WJG
App'd:	TWA	Reviewed:	0	Drawn:	WJG	Drawn:	WJG

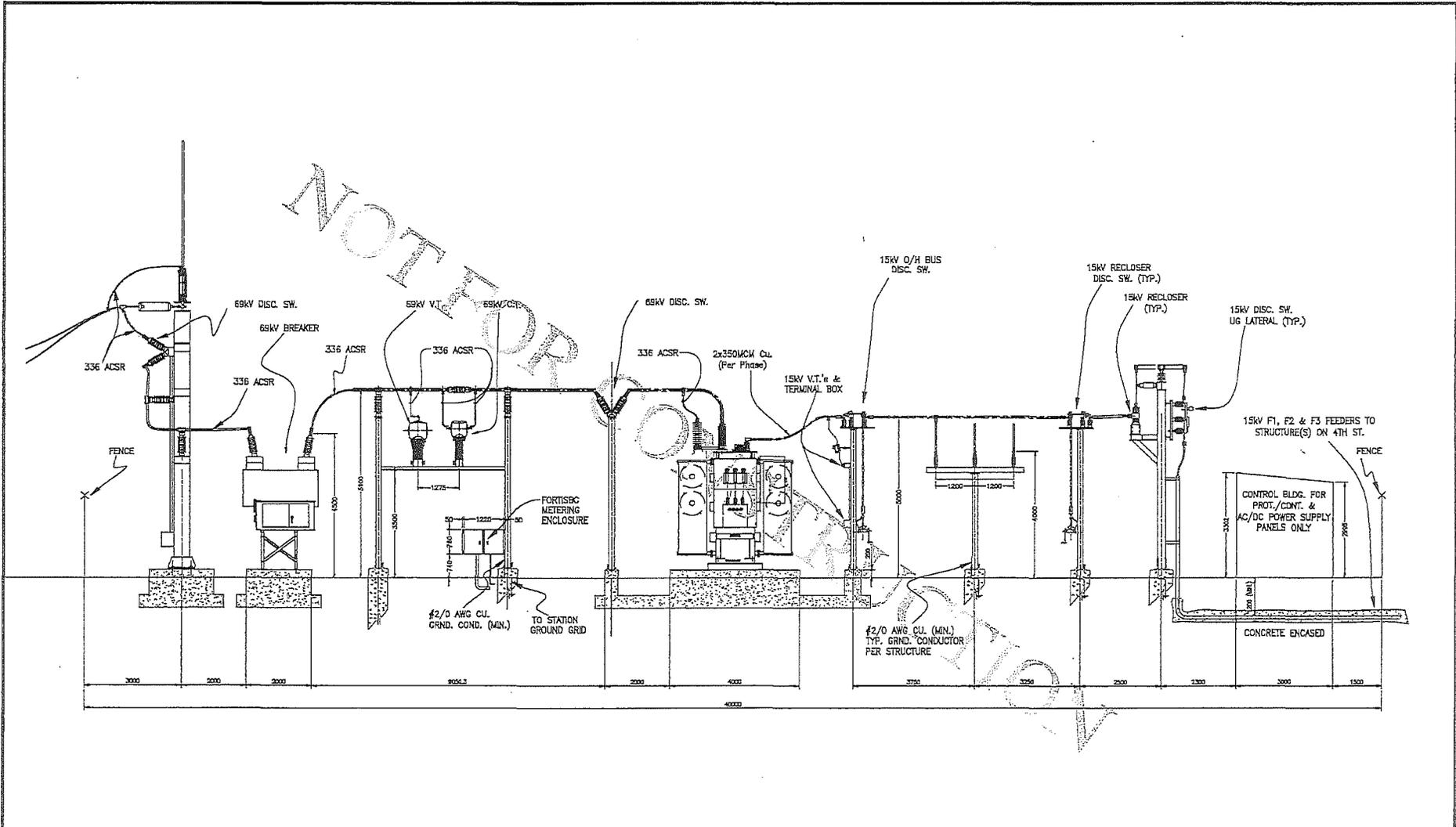
100-E-101



## Appendix IV:

### Series 101 No E-House Drawings

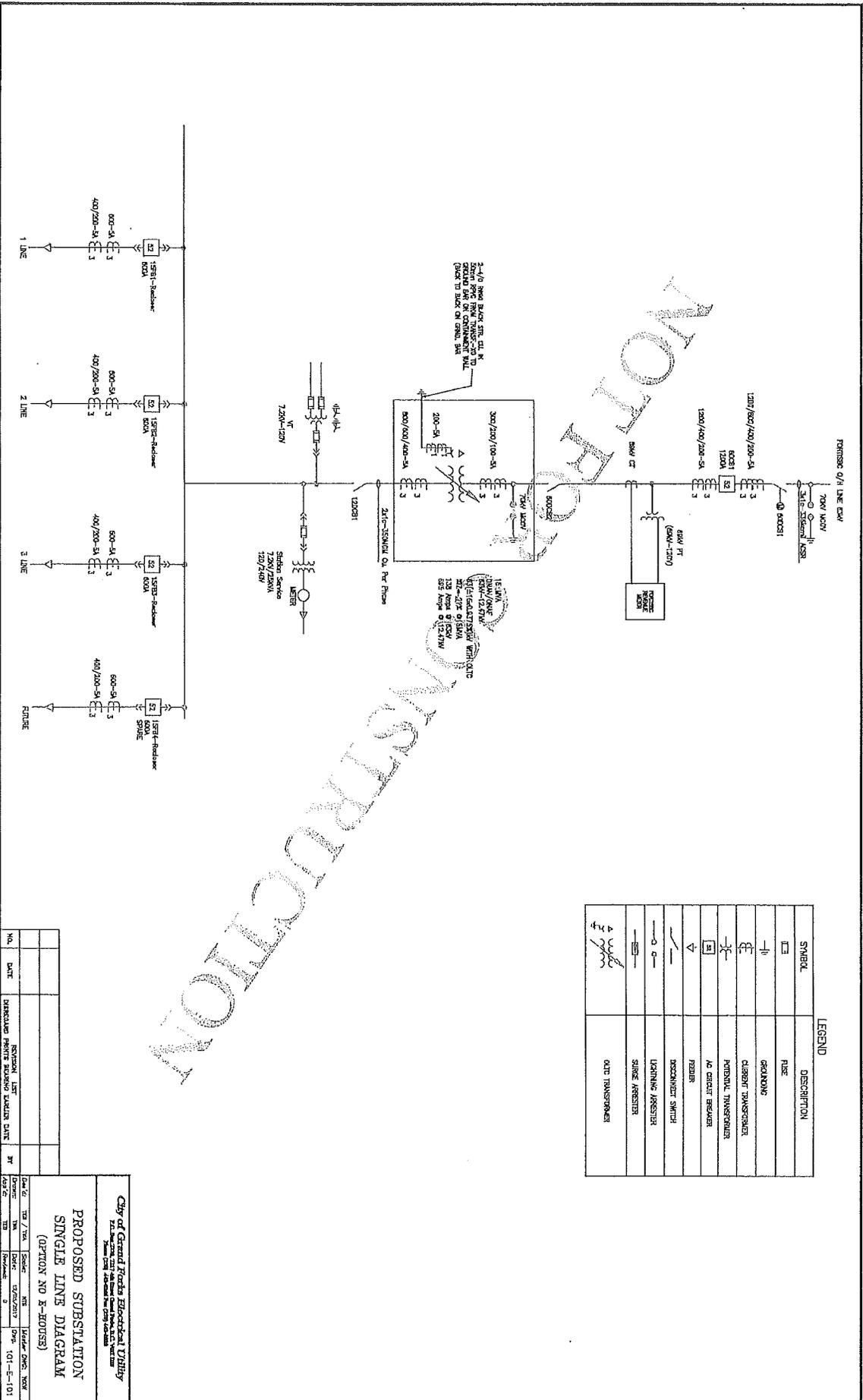
NOT FOR CONSTRUCTION



**PROPOSED SUBSTATION  
EQUIPMENT LAYOUT PROFILE**  
(OPTION W/ NO E-HOUSE)

NO.	DATE	REVISION LIST DISREGARD PRINTS BEARING EARLIER DATE	BY

Draw'n:	TMA	Scale:	N/A	Monitor:	DWG: WDW
Draw'n:	TMA	Date:	12/23/2017	Dwg.:	101-E-100
App'd:	TMA	Revised:	0		



LEGEND

SYMBOL	DESCRIPTION
—	LINE
— —	BREAKERS
— — —	CURRENT TRANSFORMER
— — — —	POTENTIAL TRANSFORMER
— — — — —	JO CIRCUIT BREAKER
— — — — — —	FEEDER
— — — — — — —	DISCONNECT SWITCH
— — — — — — — —	LOADING ARRESTER
— — — — — — — — —	SLING ARRESTER
— — — — — — — — — —	OUTER TRANSFORMER

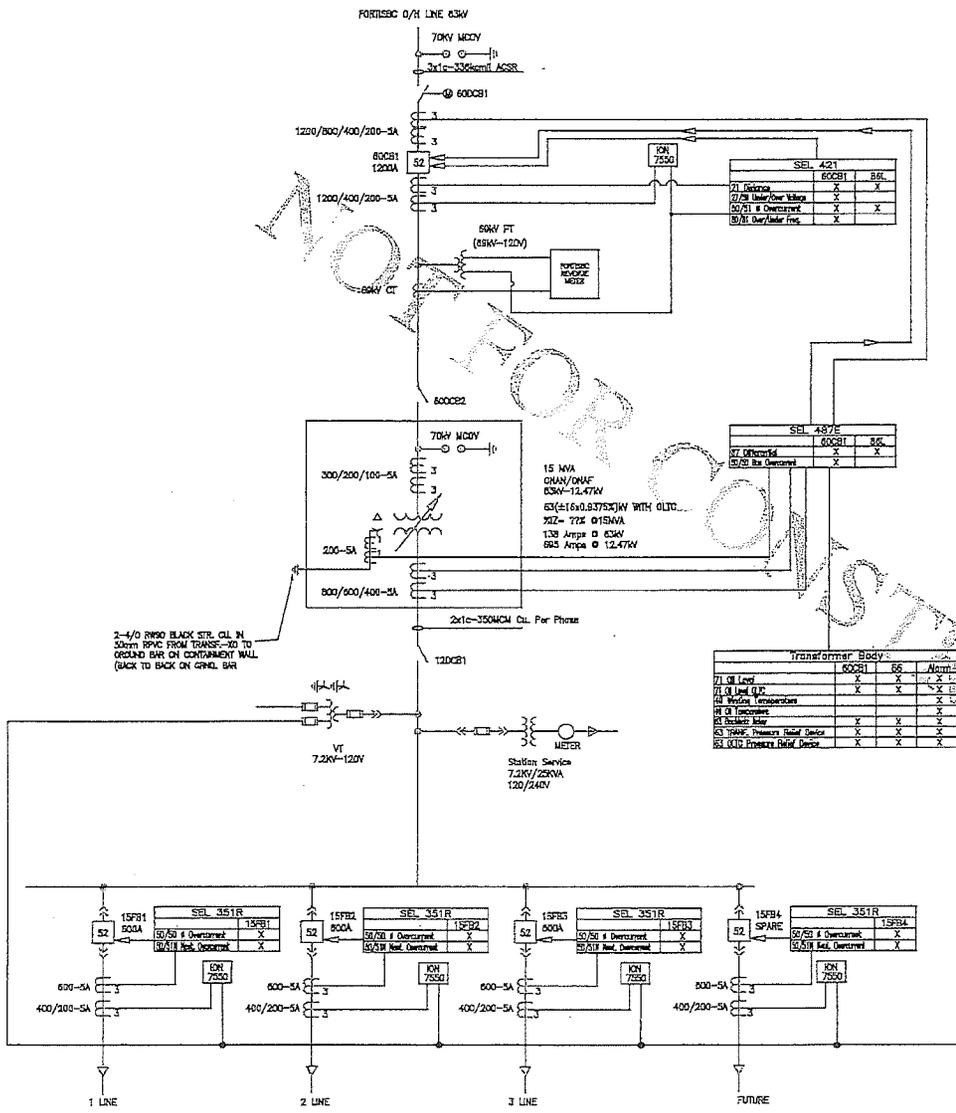
NO.	DATE	REVISIONS	BY

**City of Grand Forks Electrical Utility**  
 1500 Broadway, Grand Forks, ND 58201  
 (701) 773-1234

**PROPOSED SUBSTATION**  
**SINGLE LINE DIAGRAM**  
 (SHEET NO. 1 OF 1)

DATE	DESIGNED BY	CHECKED BY	APPROVED BY

NOT FOR CONSTRUCTION



**LEGEND**

SYMBOL	DESCRIPTION
	FUSE
	GROUNDING
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	AC CIRCUIT BREAKER
	FEEDER
	DISCONNECT SWITCH
	LIGHTNING ARRESTER
	SURGE ARRESTER
	OLTC TRANSFORMER

**SEL 421**

	600CB1	65L
71 Oil Level	X	X
71.3 Level Q.P.	X	X
71.4 Wdg Temp	X	X
71.5 Wdg Temp	X	X
71.6 Wdg Temp	X	X
71.7 Wdg Temp	X	X
71.8 Wdg Temp	X	X
71.9 Wdg Temp	X	X
71.10 Wdg Temp	X	X
71.11 Wdg Temp	X	X
71.12 Wdg Temp	X	X
71.13 Wdg Temp	X	X
71.14 Wdg Temp	X	X
71.15 Wdg Temp	X	X
71.16 Wdg Temp	X	X
71.17 Wdg Temp	X	X
71.18 Wdg Temp	X	X
71.19 Wdg Temp	X	X
71.20 Wdg Temp	X	X
71.21 Wdg Temp	X	X
71.22 Wdg Temp	X	X
71.23 Wdg Temp	X	X
71.24 Wdg Temp	X	X
71.25 Wdg Temp	X	X
71.26 Wdg Temp	X	X
71.27 Wdg Temp	X	X
71.28 Wdg Temp	X	X
71.29 Wdg Temp	X	X
71.30 Wdg Temp	X	X
71.31 Wdg Temp	X	X
71.32 Wdg Temp	X	X
71.33 Wdg Temp	X	X
71.34 Wdg Temp	X	X
71.35 Wdg Temp	X	X
71.36 Wdg Temp	X	X
71.37 Wdg Temp	X	X
71.38 Wdg Temp	X	X
71.39 Wdg Temp	X	X
71.40 Wdg Temp	X	X
71.41 Wdg Temp	X	X
71.42 Wdg Temp	X	X
71.43 Wdg Temp	X	X
71.44 Wdg Temp	X	X
71.45 Wdg Temp	X	X
71.46 Wdg Temp	X	X
71.47 Wdg Temp	X	X
71.48 Wdg Temp	X	X
71.49 Wdg Temp	X	X
71.50 Wdg Temp	X	X
71.51 Wdg Temp	X	X
71.52 Wdg Temp	X	X
71.53 Wdg Temp	X	X
71.54 Wdg Temp	X	X
71.55 Wdg Temp	X	X
71.56 Wdg Temp	X	X
71.57 Wdg Temp	X	X
71.58 Wdg Temp	X	X
71.59 Wdg Temp	X	X
71.60 Wdg Temp	X	X
71.61 Wdg Temp	X	X
71.62 Wdg Temp	X	X
71.63 Wdg Temp	X	X
71.64 Wdg Temp	X	X
71.65 Wdg Temp	X	X
71.66 Wdg Temp	X	X
71.67 Wdg Temp	X	X
71.68 Wdg Temp	X	X
71.69 Wdg Temp	X	X
71.70 Wdg Temp	X	X
71.71 Wdg Temp	X	X
71.72 Wdg Temp	X	X
71.73 Wdg Temp	X	X
71.74 Wdg Temp	X	X
71.75 Wdg Temp	X	X
71.76 Wdg Temp	X	X
71.77 Wdg Temp	X	X
71.78 Wdg Temp	X	X
71.79 Wdg Temp	X	X
71.80 Wdg Temp	X	X
71.81 Wdg Temp	X	X
71.82 Wdg Temp	X	X
71.83 Wdg Temp	X	X
71.84 Wdg Temp	X	X
71.85 Wdg Temp	X	X
71.86 Wdg Temp	X	X
71.87 Wdg Temp	X	X
71.88 Wdg Temp	X	X
71.89 Wdg Temp	X	X
71.90 Wdg Temp	X	X
71.91 Wdg Temp	X	X
71.92 Wdg Temp	X	X
71.93 Wdg Temp	X	X
71.94 Wdg Temp	X	X
71.95 Wdg Temp	X	X
71.96 Wdg Temp	X	X
71.97 Wdg Temp	X	X
71.98 Wdg Temp	X	X
71.99 Wdg Temp	X	X
71.100 Wdg Temp	X	X

**SEL 437E**

	600CB1	65L
71 Oil Level	X	X
71.3 Level Q.P.	X	X
71.4 Wdg Temp	X	X
71.5 Wdg Temp	X	X
71.6 Wdg Temp	X	X
71.7 Wdg Temp	X	X
71.8 Wdg Temp	X	X
71.9 Wdg Temp	X	X
71.10 Wdg Temp	X	X
71.11 Wdg Temp	X	X
71.12 Wdg Temp	X	X
71.13 Wdg Temp	X	X
71.14 Wdg Temp	X	X
71.15 Wdg Temp	X	X
71.16 Wdg Temp	X	X
71.17 Wdg Temp	X	X
71.18 Wdg Temp	X	X
71.19 Wdg Temp	X	X
71.20 Wdg Temp	X	X
71.21 Wdg Temp	X	X
71.22 Wdg Temp	X	X
71.23 Wdg Temp	X	X
71.24 Wdg Temp	X	X
71.25 Wdg Temp	X	X
71.26 Wdg Temp	X	X
71.27 Wdg Temp	X	X
71.28 Wdg Temp	X	X
71.29 Wdg Temp	X	X
71.30 Wdg Temp	X	X
71.31 Wdg Temp	X	X
71.32 Wdg Temp	X	X
71.33 Wdg Temp	X	X
71.34 Wdg Temp	X	X
71.35 Wdg Temp	X	X
71.36 Wdg Temp	X	X
71.37 Wdg Temp	X	X
71.38 Wdg Temp	X	X
71.39 Wdg Temp	X	X
71.40 Wdg Temp	X	X
71.41 Wdg Temp	X	X
71.42 Wdg Temp	X	X
71.43 Wdg Temp	X	X
71.44 Wdg Temp	X	X
71.45 Wdg Temp	X	X
71.46 Wdg Temp	X	X
71.47 Wdg Temp	X	X
71.48 Wdg Temp	X	X
71.49 Wdg Temp	X	X
71.50 Wdg Temp	X	X
71.51 Wdg Temp	X	X
71.52 Wdg Temp	X	X
71.53 Wdg Temp	X	X
71.54 Wdg Temp	X	X
71.55 Wdg Temp	X	X
71.56 Wdg Temp	X	X
71.57 Wdg Temp	X	X
71.58 Wdg Temp	X	X
71.59 Wdg Temp	X	X
71.60 Wdg Temp	X	X
71.61 Wdg Temp	X	X
71.62 Wdg Temp	X	X
71.63 Wdg Temp	X	X
71.64 Wdg Temp	X	X
71.65 Wdg Temp	X	X
71.66 Wdg Temp	X	X
71.67 Wdg Temp	X	X
71.68 Wdg Temp	X	X
71.69 Wdg Temp	X	X
71.70 Wdg Temp	X	X
71.71 Wdg Temp	X	X
71.72 Wdg Temp	X	X
71.73 Wdg Temp	X	X
71.74 Wdg Temp	X	X
71.75 Wdg Temp	X	X
71.76 Wdg Temp	X	X
71.77 Wdg Temp	X	X
71.78 Wdg Temp	X	X
71.79 Wdg Temp	X	X
71.80 Wdg Temp	X	X
71.81 Wdg Temp	X	X
71.82 Wdg Temp	X	X
71.83 Wdg Temp	X	X
71.84 Wdg Temp	X	X
71.85 Wdg Temp	X	X
71.86 Wdg Temp	X	X
71.87 Wdg Temp	X	X
71.88 Wdg Temp	X	X
71.89 Wdg Temp	X	X
71.90 Wdg Temp	X	X
71.91 Wdg Temp	X	X
71.92 Wdg Temp	X	X
71.93 Wdg Temp	X	X
71.94 Wdg Temp	X	X
71.95 Wdg Temp	X	X
71.96 Wdg Temp	X	X
71.97 Wdg Temp	X	X
71.98 Wdg Temp	X	X
71.99 Wdg Temp	X	X
71.100 Wdg Temp	X	X

**Transformer Body:**

	600CB1	65L	Alarm
71 Oil Level	X	X	X
71.3 Level Q.P.	X	X	X
71.4 Wdg Temp	X	X	X
71.5 Wdg Temp	X	X	X
71.6 Wdg Temp	X	X	X
71.7 Wdg Temp	X	X	X
71.8 Wdg Temp	X	X	X
71.9 Wdg Temp	X	X	X
71.10 Wdg Temp	X	X	X
71.11 Wdg Temp	X	X	X
71.12 Wdg Temp	X	X	X
71.13 Wdg Temp	X	X	X
71.14 Wdg Temp	X	X	X
71.15 Wdg Temp	X	X	X
71.16 Wdg Temp	X	X	X
71.17 Wdg Temp	X	X	X
71.18 Wdg Temp	X	X	X
71.19 Wdg Temp	X	X	X
71.20 Wdg Temp	X	X	X
71.21 Wdg Temp	X	X	X
71.22 Wdg Temp	X	X	X
71.23 Wdg Temp	X	X	X
71.24 Wdg Temp	X	X	X
71.25 Wdg Temp	X	X	X
71.26 Wdg Temp	X	X	X
71.27 Wdg Temp	X	X	X
71.28 Wdg Temp	X	X	X
71.29 Wdg Temp	X	X	X
71.30 Wdg Temp	X	X	X
71.31 Wdg Temp	X	X	X
71.32 Wdg Temp	X	X	X
71.33 Wdg Temp	X	X	X
71.34 Wdg Temp	X	X	X
71.35 Wdg Temp	X	X	X
71.36 Wdg Temp	X	X	X
71.37 Wdg Temp	X	X	X
71.38 Wdg Temp	X	X	X
71.39 Wdg Temp	X	X	X
71.40 Wdg Temp	X	X	X
71.41 Wdg Temp	X	X	X
71.42 Wdg Temp	X	X	X
71.43 Wdg Temp	X	X	X
71.44 Wdg Temp	X	X	X
71.45 Wdg Temp	X	X	X
71.46 Wdg Temp	X	X	X
71.47 Wdg Temp	X	X	X
71.48 Wdg Temp	X	X	X
71.49 Wdg Temp	X	X	X
71.50 Wdg Temp	X	X	X
71.51 Wdg Temp	X	X	X
71.52 Wdg Temp	X	X	X
71.53 Wdg Temp	X	X	X
71.54 Wdg Temp	X	X	X
71.55 Wdg Temp	X	X	X
71.56 Wdg Temp	X	X	X
71.57 Wdg Temp	X	X	X
71.58 Wdg Temp	X	X	X
71.59 Wdg Temp	X	X	X
71.60 Wdg Temp	X	X	X
71.61 Wdg Temp	X	X	X
71.62 Wdg Temp	X	X	X
71.63 Wdg Temp	X	X	X
71.64 Wdg Temp	X	X	X
71.65 Wdg Temp	X	X	X
71.66 Wdg Temp	X	X	X
71.67 Wdg Temp	X	X	X
71.68 Wdg Temp	X	X	X
71.69 Wdg Temp	X	X	X
71.70 Wdg Temp	X	X	X
71.71 Wdg Temp	X	X	X
71.72 Wdg Temp	X	X	X
71.73 Wdg Temp	X	X	X
71.74 Wdg Temp	X	X	X
71.75 Wdg Temp	X	X	X
71.76 Wdg Temp	X	X	X
71.77 Wdg Temp	X	X	X
71.78 Wdg Temp	X	X	X
71.79 Wdg Temp	X	X	X
71.80 Wdg Temp	X	X	X
71.81 Wdg Temp	X	X	X
71.82 Wdg Temp	X	X	X
71.83 Wdg Temp	X	X	X
71.84 Wdg Temp	X	X	X
71.85 Wdg Temp	X	X	X
71.86 Wdg Temp	X	X	X
71.87 Wdg Temp	X	X	X
71.88 Wdg Temp	X	X	X
71.89 Wdg Temp	X	X	X
71.90 Wdg Temp	X	X	X
71.91 Wdg Temp	X	X	X
71.92 Wdg Temp	X	X	X
71.93 Wdg Temp	X	X	X
71.94 Wdg Temp	X	X	X
71.95 Wdg Temp	X	X	X
71.96 Wdg Temp	X	X	X
71.97 Wdg Temp	X	X	X
71.98 Wdg Temp	X	X	X
71.99 Wdg Temp	X	X	X
71.100 Wdg Temp	X	X	X

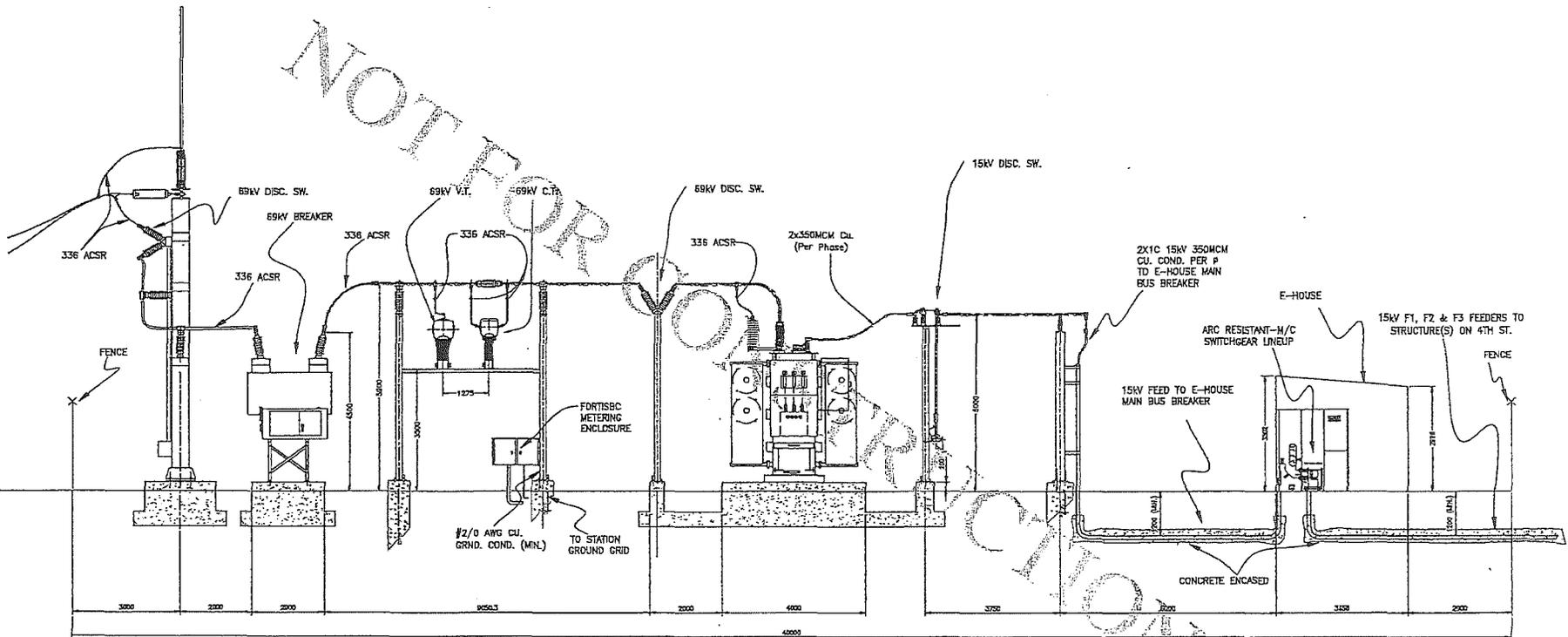
**City of Grand Forks Electrical Utility**  
 210 1st Ave S, Grand Forks, ND 58201  
 Phone: (701) 773-3333 Fax: (701) 773-3334

**PROPOSED SUBSTATION  
 PROTECTION SCHEME  
 (OPTION W/ NO E-HOUSE)**

NO.	DATE	REVISION LIST	BY

Drawn By	YEB / TBA	Checked By	MTS	Master Drawn By	WAW
Drawn Date	12/06/2017	Checked Date	12/06/2017	Drawn Date	101-E-102
App'd By		App'd Date			

NOT FOR CONSTRUCTION



**PROPOSED SUBSTATION  
EQUIPMENT LAYOUT PROFILE  
(OPTION #/ E-HOUSE)**

NO.	DATE	REVISION LIST	BY
		DISREGARD PRINTS BEARING EARLIER DATE	

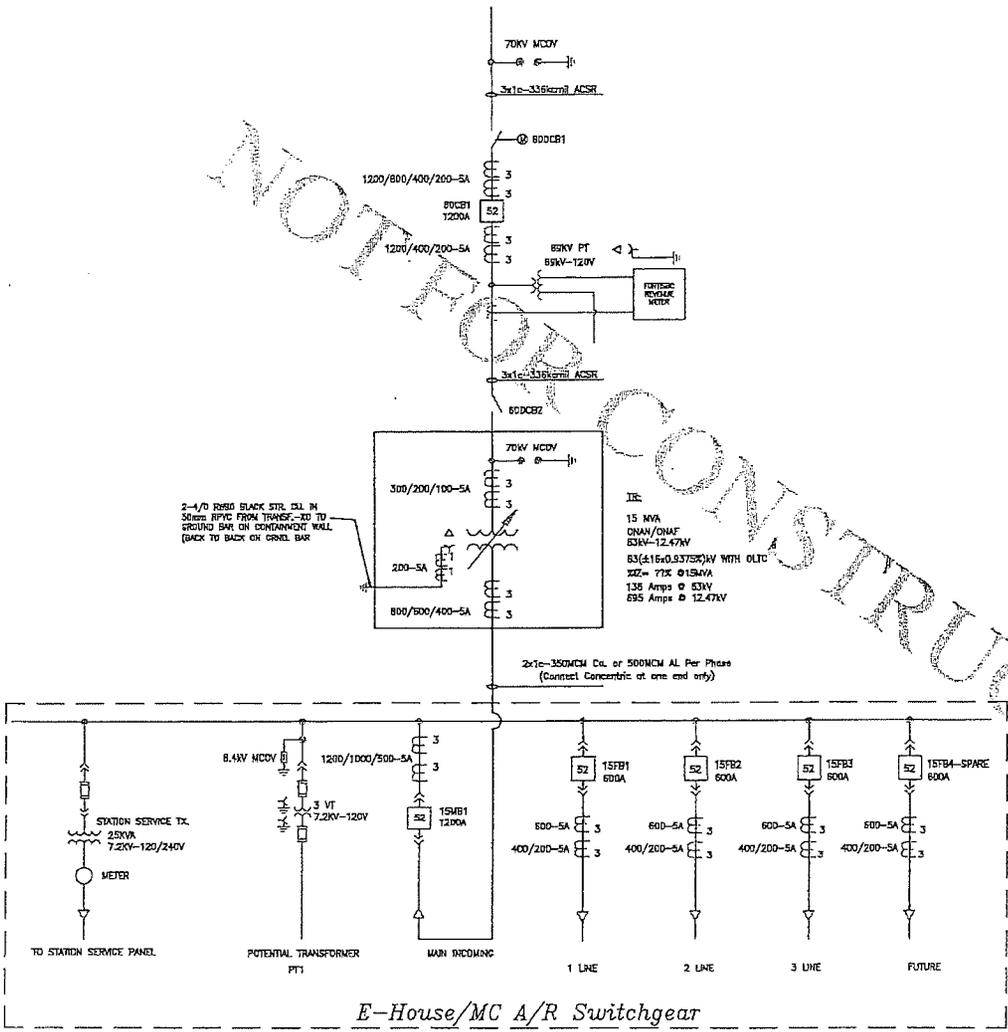
Scale:	TMA	Sheet:	HTS	Master Dwg. No.:	WAW
Drawn:	TMA	Date:	12/03/2017	App.:	100-E-100
App'd:	YTB	Revised:	0		

FORTIBCO O/H LINE 63KV

NOT FOR CONSTRUCTION

LEGEND

SYMBOL	DESCRIPTION
	FUSE
	GROUNDING
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	AC CIRCUIT BREAKER
	FEEDER
	DISCONNECT SWITCH
	LIGHTNING ARRESTER
	SURGE ARRESTER
	OLTC TRANSFORMER



E-House/MC A/R Switchgear

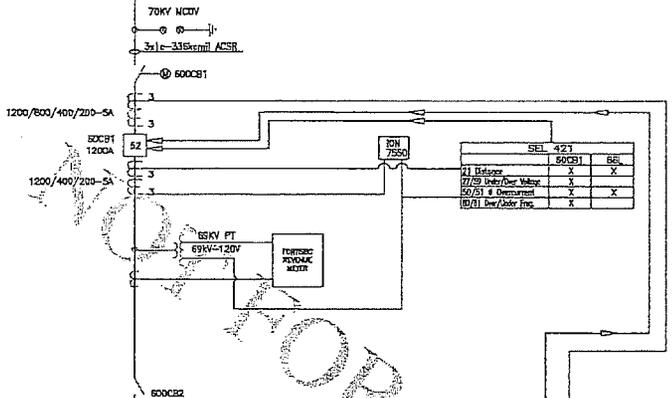
City of Grand Forks Electrical Utility  
P.O. Box 1221, 1317 4th Street Grand Forks, N.D. 58201  
Phone (701) 445-4354 Fax (701) 445-4351

PROPOSED SUBSTATION  
SINGLE LINE DIAGRAM  
(OPTION W/ E-HOUSE)

NO.	DATE	REVISION LIST	BY

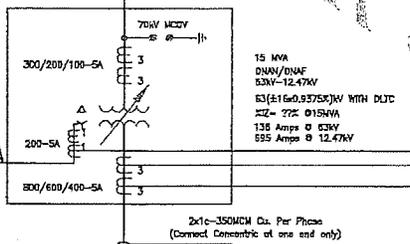
Drawn By: TBA	Scale: NTS	Master Drawn By: WDF
App'd By: TBA	Date: 12/04/2017	Sheet: 100-E-101
	Revised: 0	

FORTISBC O/H LINE 63KV



LEGEND

SYMBOL	DESCRIPTION
	FUSE
	GROUNDING
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	AC CIRCUIT BREAKER
	FEEDER
	DISCONNECT SWITCH
	LIGHTNING ARRESTER
	SURGE ARRESTER
	OHT TRANSFORMER

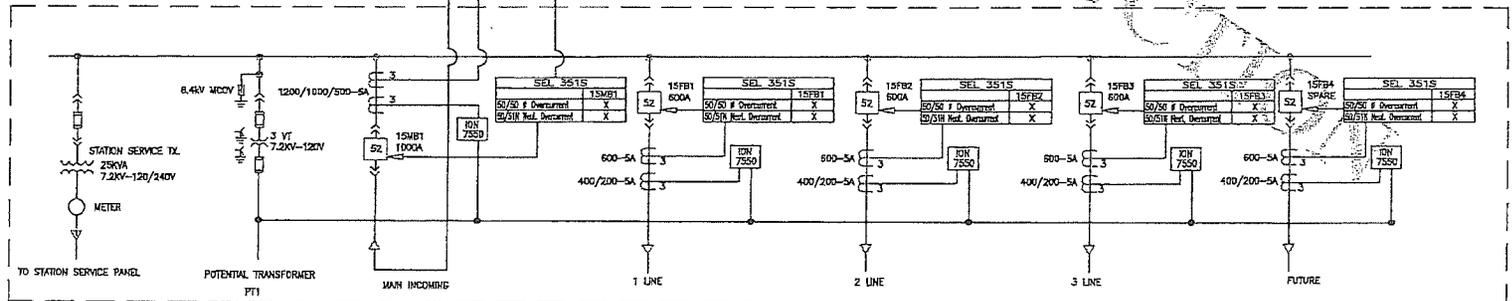


SEL 487E			
	600CB1	15MB1	B5C
07 Tr. Differential	X	X	X
50/51 Bus Overcurrent	X	X	X
07 Bus Differential	X	X	X

Transformer Body				
	600CB1	R5	Alarm	
71 Oil Level	X	X	X	X
71 Oil Level 2"	X	X	X	X
43 Winding Temperature	X	X	X	X
40 Oil Temperature	X	X	X	X
61 Tanky Leak	X	X	X	X
63 TRANS. Pressure Relief Device	X	X	X	X
65 OHT Pressure Relief Device	X	X	X	X

2-4/0 REXD BLACK STR. CIL IN 50mm RVC FROM TRANS- TO TO RINGING BAR ON CONTAINMENT WALL (BACK TO BACK ON GRND. BAR)

2x1e-350MCM Cu. Per Phase (Connect Concentric at one end only)



E-House/MC A/R Switchgear

City of Grand Forks Electrical Utility  
 710 2nd Street, 2ND FLOOR Grand Forks, ND 58201  
 Phone (701) 463-2344 Fax (701) 463-2000

PROPOSED SUBSTATION  
 PROTECTION SCHEME  
 (OPTION W/ E-HOUSE)

NO.	DATE	REVISION LIST	BY
		DISCARD PRINTS BEARING EARLIER DATE	

Des'g	TEL / TMA	Scale	WYS	Master DWG	WYS
Drewn	TMA	Defac	12/25/2017	Swg	100-E-102
App'd	TEL	Revised	0		

# **SCHEDULE “F”**

Updated Cost Estimates for Grand Forks Substation



Settle down.

The Corporation of the City of Grand Forks  
Box 220 – 6350 2<sup>nd</sup> Street, Grand Forks, British Columbia, V0H 1H0  
• Phone: (250) 442-8266 • Facsimile: (250) 442-8263•

September 04, 2020

Christopher Weafer  
Owen Bird Law Corporation  
Three Bentall Centre  
2900-595 Burrard Street  
Vancouver, BC V7X 1J5

**Via: email**  
cweafer@owenbird.com

Dear Mr. Weafer:

**RE: Grand Forks Electric – Transmission Customer – Updated Costs**

You had asked about any changes to cost estimates for building a Grand Forks Substation since the original costs were calculated in 2017. Following is an updated capital costs estimate as well as operating cost estimate and cash flow analysis.

**1. Capital Cost Estimate**

Consistent with 2018 application to FortisBC this estimate update considers;

- The higher cost location option (Further underground cabling) – a conservative estimate, and
- The higher cost construction style option (with an E-house) as this is what Grand Forks would build if constructing a physical station

The costs were re-estimated by;

- Obtaining updated quotes for major equipment,
- Applying inflationary increases for smaller items, and
- Recognizing the change in property values as a result of the 2018 flooding in Grand Forks.

	Loc 1 (2017)	Loc 2 (2017)	Loc 2 (2020)
Property Acquisition .....	\$77,400	\$83,500	\$50,000
Proj. Mgmt. and Engineering .....	\$386,450	\$386,450	\$405,425
Site Preparation .....	\$279,750	\$279,750	\$293,486
Ground Grid and Fencing.....	\$88,210	\$88,210	\$92,541
Foundations .....	\$120,600	\$120,600	\$126,521

Equipment Purchase.....	\$1,624,300	.....\$1,624,300	.....\$1,825,237
Structure and Equipment Erection .....	\$67,045	.....\$67,045	.....\$70,145
Test and Commission .....	\$116,030	.....\$116,030	.....\$125,559
15 kV Conduit and Cable .....	\$214,948	.....\$329,988	.....\$183,750
Control Cabling .....	\$34,400	.....\$34,400	.....\$111,624
FortisBC Interconnect (60 kV).....	\$140,500	.....\$140,500	.....\$136,383
Contingency .....	\$629,927	.....\$654,157	.....\$684,134
<b>Total Substation (Before Tax)</b>	<b>\$3,779,560</b>	<b>\$3,924,930</b>	<b>\$4,104,805</b>

## 2. Financing Costs

The Cash flow analysis was also updated to 2020 figures. The notable changes are;

- Capital Costs increased as noted in item 1 above,
- Interest rates from MFA have decreased from 3.23% (2017) to a blended rate of 1.67% (2020) – used in the August 03, 2020 analysis,  
To accurately reflect an actual debt draw from MFA this September 04, 2020 analysis uses today's MFA rates for either a 10 year (1.56%) or 20 year (2.38%) term, - see cash flow analysis attached,
- Substation maintenance cost estimates were increased for inflationary increases and checked against Nelson Hydro's average costs of maintenance for its Rosemont Substation.

## 3. Conclusions

The draft Bypass Rate Agreement between Grand Forks and FortisBC should be updated to reflect the current cost estimates of 2020.

The Bypass rate rider amount should be updated to a 2020 calculated figured of \$260,335.98 or \$21,694.67 per month based on a 20 year term at 2.38%.

The Operations and Maintenance Rider should be updated to a 2020 calculated figure of \$28,233.00 or \$2,352.75 per month (effective 2020).

Yours truly,



Alexander Love  
Consultant

Att: MFA Indicative Market Rates, Sep 03, 2020  
Cash Flow Analysis Rev12 – 10 Year  
Cash Flow Analysis Rev12 – 20 Year

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<https://mfa.bc.ca/long-term-lending-rates>  
As at: September 3, 2020.

**Indicative Market Rates - Analytic Purposes Only**

On occasion the MFA will set rates for terms other than 10 years. These are the **current market rates (as of today)** associated with those terms and should be used for analytical purposes only.

*Clients are reminded that traditionally the MFA will set the lending rate for the first 10 years on commencement of an issue and then reset that rate generally each 5 year period thereafter.*

<b>5 years</b>	<b>1.05%</b>
<b>10 years</b>	<b>1.56%</b>
<b>15 years</b>	<b>2.07%</b>
<b>20 years</b>	<b>2.38%</b>
<b>25 years</b>	<b>2.38%</b>
<b>30 years</b>	<b>2.38%</b>

**Grand Forks Electric  
Transmission Customer Analysis**

2020-09-04  
Tx Cust Analysis (Rev12 Updated Sept 2020 Costs)

**Power Purchase Forecast**

Actl Fcat	Year	RS40 Energy					RS40 Tx Basic				
		RS40 Basic (\$)	RS40 Energy (\$)	RS40 Pwr Sup (\$)	RS40 Wires (\$)	RS40 Invoice (\$)	RS40 Tx Basic (\$)	RS40 Tx Energy (\$)	RS40 Tx Pwr Sup (\$)	RS40 Tx Wires (\$)	RS40 Tx Invoice (\$)
A	2017	\$95,221	\$2,151,332	\$764,047	\$378,114	\$3,388,714	\$92,676	\$1,846,631	\$378,158	\$539,354	\$2,856,919
	2018	\$39,675	\$876,923	\$289,237	\$150,709	\$1,356,554	\$26,450	\$752,611	\$150,726	\$204,177	\$1,134,165
F	2018	\$39,675	\$1,316,116	\$479,611	\$246,691	\$2,082,096	\$37,030	\$1,128,834	\$246,720	\$336,565	\$1,752,150
	2019	\$65,703	\$2,252,001	\$826,981	\$419,967	\$3,564,262	\$65,703	\$1,833,276	\$419,615	\$583,780	\$3,002,379
	2020	\$88,002	\$2,345,683	\$860,205	\$436,423	\$3,710,913	\$88,002	\$2,019,674	\$436,473	\$607,234	\$3,123,386
	2021	\$88,002	\$2,359,493	\$864,506	\$438,605	\$3,730,607	\$88,002	\$2,025,830	\$438,656	\$610,270	\$3,142,457
<b>Grand Total</b>		<b>\$376,278</b>	<b>\$11,801,591</b>	<b>\$4,084,687</b>	<b>\$2,070,109</b>	<b>\$17,832,586</b>	<b>\$357,764</b>	<b>\$9,701,858</b>	<b>\$2,070,348</b>	<b>\$2,883,380</b>	<b>\$15,013,449</b>

5 Years at RS 40 \$17,832,586  
5 Years at RS 40 Tx \$15,013,449  
Rs 40 Tx / RS 40 84.19%

**Cash Flow Analysis**

Capital Cost	Capital Cost	Base / Year	Annual Maint	Insurance	Operating Costs	RS 40 PP	RS40 Tx PP	PP Savings	Net	Cumulative
\$4,104,805	\$4,104,805	1.56%	\$24,693	\$3,540	\$ 28,233.00	\$3,564,282	84.20% % of RS40			
Interest rate	1.56%	Escalation	3.50%							
Years	10									
Payment	\$ 446,517.17									
Year	Year									
1	2020	-\$446,517	(\$24,693)	(\$3,540)	-\$29,233	(\$3,564,282)	(\$3,001,125)	\$563,157	\$88,406	\$88,406
2	2021	-\$446,517	(\$26,557)	(\$3,664)	-\$30,221	(\$3,689,032)	(\$3,106,165)	\$582,867	\$107,129	\$195,535
3	2022	-\$446,517	(\$26,452)	(\$3,792)	-\$30,244	(\$3,818,148)	(\$3,214,680)	\$603,267	\$126,506	\$322,041
4	2023	-\$446,517	(\$27,378)	(\$3,929)	-\$31,307	(\$3,951,783)	(\$3,327,401)	\$624,282	\$146,562	\$468,603
5	2024	-\$446,517	(\$28,336)	(\$4,067)	-\$32,399	(\$4,086,095)	(\$3,440,628)	\$646,258	\$167,220	\$635,823
6	2025	-\$446,517	(\$29,324)	(\$4,204)	-\$33,522	(\$4,223,249)	(\$3,556,356)	\$668,853	\$188,804	\$824,728
7	2026	-\$446,517	(\$30,354)	(\$4,352)	-\$34,706	(\$4,361,412)	(\$3,683,149)	\$692,263	\$211,040	\$1,035,768
8	2027	-\$446,517	(\$31,416)	(\$4,504)	-\$35,920	(\$4,534,762)	(\$3,818,270)	\$716,492	\$234,056	\$1,269,823
9	2028	-\$446,517	(\$32,516)	(\$4,662)	-\$37,177	(\$4,609,479)	(\$3,951,906)	\$741,570	\$257,875	\$1,527,698
10	2029	-\$446,517	(\$33,654)	(\$4,825)	-\$38,479	(\$4,687,750)	(\$4,090,226)	\$767,525	\$282,529	\$1,810,227
11	2030	\$0	(\$34,832)	(\$4,994)	-\$39,825	(\$5,027,772)	(\$4,233,384)	\$794,388	\$754,962	\$2,594,789
12	2031	\$0	(\$36,051)	(\$5,169)	-\$41,219	(\$5,203,744)	(\$4,381,552)	\$822,191	\$760,872	\$3,345,701
13	2032	\$0	(\$37,313)	(\$5,348)	-\$42,659	(\$5,385,875)	(\$4,534,905)	\$850,958	\$808,305	\$4,154,007
14	2033	\$0	(\$38,619)	(\$5,530)	-\$44,155	(\$5,574,380)	(\$4,693,628)	\$880,752	\$836,597	\$4,990,604
15	2034	\$0	(\$39,970)	(\$5,730)	-\$45,701	(\$5,769,484)	(\$4,857,905)	\$911,758	\$865,876	\$5,856,542
16	2035	\$0	(\$41,369)	(\$5,931)	-\$47,300	(\$5,971,415)	(\$5,027,932)	\$943,484	\$896,184	\$6,752,726
17	2036	\$0	(\$42,817)	(\$6,136)	-\$48,955	(\$6,180,415)	(\$5,203,909)	\$976,506	\$927,550	\$7,680,276
18	2037	\$0	(\$44,316)	(\$6,353)	-\$50,665	(\$6,398,730)	(\$5,386,046)	\$1,010,683	\$960,014	\$8,640,290
19	2038	\$0	(\$45,867)	(\$6,576)	-\$52,442	(\$6,620,615)	(\$5,574,558)	\$1,045,057	\$993,615	\$9,633,905
20	2039	\$0	(\$47,472)	(\$6,805)	-\$54,278	(\$6,850,337)	(\$5,769,687)	\$1,082,669	\$1,028,991	\$10,662,296
21	2040	\$0	(\$49,134)	(\$7,044)	-\$56,178	(\$7,092,168)	(\$5,971,606)	\$1,120,563	\$1,064,385	\$11,726,681
22	2041	\$0	(\$50,854)	(\$7,290)	-\$58,144	(\$7,340,394)	(\$6,180,612)	\$1,159,782	\$1,101,638	\$12,828,319
23	2042	\$0	(\$52,633)	(\$7,548)	-\$60,179	(\$7,597,308)	(\$6,396,933)	\$1,200,375	\$1,140,196	\$13,968,515
24	2043	\$0	(\$54,476)	(\$7,810)	-\$62,285	(\$7,663,214)	(\$6,620,826)	\$1,242,388	\$1,180,103	\$15,148,617
25	2044	\$0	(\$56,382)	(\$8,083)	-\$64,465	(\$8,138,426)	(\$6,852,555)	\$1,285,871	\$1,221,406	\$16,370,023
26	2045	\$0	(\$58,346)	(\$8,366)	-\$66,712	(\$8,423,271)	(\$7,097,394)	\$1,330,877	\$1,264,195	\$17,634,179
27	2046	\$0	(\$60,368)	(\$8,659)	-\$69,027	(\$8,718,086)	(\$7,340,628)	\$1,377,458	\$1,308,401	\$18,942,590
28	2047	\$0	(\$62,447)	(\$8,962)	-\$71,474	(\$9,023,219)	(\$7,597,550)	\$1,425,669	\$1,354,195	\$20,296,774
29	2048	\$0	(\$64,580)	(\$9,275)	-\$73,975	(\$9,338,031)	(\$7,864,464)	\$1,475,567	\$1,401,692	\$21,698,366
30	2049	\$0	(\$66,764)	(\$9,600)	-\$76,564	(\$9,666,868)	(\$8,138,686)	\$1,527,212	\$1,450,647	\$23,148,013
31	2050	\$0	(\$69,008)	(\$9,938)	-\$79,244	(\$10,004,204)	(\$8,423,540)	\$1,580,664	\$1,501,420	\$24,650,433
32	2051	\$0	(\$71,334)	(\$10,284)	-\$82,018	(\$10,354,351)	(\$8,718,364)	\$1,635,987	\$1,553,970	\$26,204,403
33	2052	\$0	(\$74,245)	(\$10,644)	-\$84,888	(\$10,716,753)	(\$9,023,506)	\$1,693,247	\$1,608,369	\$27,817,762
34	2053	\$0	(\$76,843)	(\$11,016)	-\$87,859	(\$11,091,840)	(\$9,339,328)	\$1,752,511	\$1,664,851	\$29,477,413
35	2054	\$0	(\$79,533)	(\$11,402)	-\$90,935	(\$11,480,054)	(\$9,666,206)	\$1,813,949	\$1,722,914	\$31,200,327
36	2055	\$0	(\$82,316)	(\$11,801)	-\$94,117	(\$11,881,856)	(\$10,004,523)	\$1,877,333	\$1,783,216	\$32,983,543
37	2056	\$0	(\$85,197)	(\$12,214)	-\$97,411	(\$12,297,721)	(\$10,354,681)	\$1,943,040	\$1,845,629	\$34,829,172
38	2057	\$0	(\$88,179)	(\$12,641)	-\$100,821	(\$12,728,141)	(\$10,717,095)	\$2,011,046	\$1,910,226	\$36,739,397
39	2058	\$0	(\$91,266)	(\$13,084)	-\$104,349	(\$13,173,626)	(\$11,092,193)	\$2,081,433	\$1,977,083	\$38,716,480
40	2059	\$0	(\$94,460)	(\$13,542)	-\$108,002	(\$13,634,703)	(\$11,480,420)	\$2,154,283	\$2,044,281	\$40,762,762
41	2060	\$0	(\$97,766)	(\$14,016)	-\$111,782	(\$14,111,919)	(\$11,882,235)	\$2,229,693	\$2,117,901	\$42,882,655
42	2061	\$0	(\$101,188)	(\$14,504)	-\$115,692	(\$14,609,131)	(\$12,292,722)	\$2,309,722	\$2,192,028	\$45,074,683
43	2062	\$0	(\$104,729)	(\$15,014)	-\$119,743	(\$15,117,039)	(\$12,728,547)	\$2,388,482	\$2,268,749	\$47,341,440
44	2063	\$0	(\$108,395)	(\$15,540)	-\$123,934	(\$15,646,135)	(\$13,174,046)	\$2,472,089	\$2,348,155	\$49,689,534
45	2064	\$0	(\$112,189)	(\$16,083)	-\$128,272	(\$16,193,750)	(\$13,635,138)	\$2,558,613	\$2,430,340	\$52,119,935
46	2065	\$0	(\$116,115)	(\$16,646)	-\$132,762	(\$16,760,531)	(\$14,112,367)	\$2,648,164	\$2,515,402	\$54,635,337
47	2066	\$0	(\$120,179)	(\$17,229)	-\$137,408	(\$17,347,150)	(\$14,606,300)	\$2,740,850	\$2,603,441	\$57,238,778
48	2067	\$0	(\$124,396)	(\$17,832)	-\$142,216	(\$17,964,300)	(\$15,117,521)	\$2,836,779	\$2,694,962	\$59,933,340
49	2068	\$0	(\$128,739)	(\$18,456)	-\$147,195	(\$18,582,701)	(\$15,646,634)	\$2,936,067	\$2,788,871	\$62,722,212
50	2069	\$0	(\$133,245)	(\$19,102)	-\$152,347	(\$19,230,095)	(\$16,194,266)	\$3,038,629	\$2,886,482	\$65,606,694
<b>Total</b>		<b>(\$4,465,172)</b>	<b>(\$3,234,731)</b>	<b>(\$463,733)</b>	<b>-\$3,698,464</b>	<b>(\$466,913,476)</b>	<b>(\$383,141,147)</b>	<b>\$73,772,329</b>	<b>\$65,608,694</b>	<b>\$1,312,174</b>
<b>Average</b>		<b>(\$89,303)</b>	<b>(\$64,695)</b>	<b>(\$9,275)</b>	<b>-\$73,975</b>	<b>(\$9,338,270)</b>	<b>(\$7,862,823)</b>	<b>\$1,475,447</b>	<b>\$13,121,783</b>	<b>\$26,213,474</b>

**Financing Comparison**

Capital Cost	\$3,924,930	\$3,924,930	\$3,924,930
Interest rate	3.23%	3.23%	3.23%
Years	10	15	20
Payment	(\$465,539)	(\$334,272)	(\$269,459)
Year	10 Year	15 Year	20 Year
1	\$93,452	\$230,946	\$289,458
2	\$112,442	\$249,936	\$318,448
3	\$132,097	\$269,991	\$338,103
4	\$152,439	\$289,934	\$358,446
5	\$173,484	\$309,930	\$379,500
6	\$195,285	\$332,780	\$401,292
7	\$217,840	\$355,334	\$423,846
8	\$241,180	\$378,677	\$447,189
9	\$265,344	\$402,838	\$471,350
10	\$290,350	\$427,844	\$496,356
11	\$765,351	\$453,726	\$522,238
12	\$760,372	\$345,701	\$549,025
13	\$819,883	\$4,154,067	\$576,750
14	\$848,558	\$536,933	\$605,445
15	\$878,256	\$566,632	\$635,144
16	\$908,997	\$908,997	\$665,893
17	\$940,811	\$940,811	\$697,698
18	\$973,740	\$973,740	\$730,527
19	\$1,007,821	\$1,007,821	\$764,798
20	\$1,043,054	\$1,043,054	\$799,981
21	\$1,079,603	\$1,079,603	\$1,079,603
22	\$1,117,389	\$1,117,389	\$1,117,389
23	\$1,156,498	\$1,156,498	\$1,156,498
24	\$1,196,975	\$1,196,975	\$1,196,975
25	\$1,238,869	\$1,238,869	\$1,238,869
26	\$1,282,229	\$1,282,229	\$1,282,229
27	\$1,327,107	\$1,327,107	\$1,327,107
28	\$1,373,556	\$1,373,556	\$1,373,556
29	\$1,421,631	\$1,421,631	\$1,421,631
30	\$1,471,388	\$1,471,388	\$1,471,388
31	\$1,522,886	\$1,522,886	\$1,522,886
32	\$1,576,187	\$1,576,187	\$1,576,187
33	\$1,631,354	\$1,631,354	\$1,631,354
34	\$1,688,451	\$1,688,451	\$1,688,451
35	\$1,747,547	\$	

