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All the time.



June 8, 2021

Island Regulatory & Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1



*Hand Del
3.23 pm
MLA*

Dear Commissioners:

***2021 Supplemental Capital Budget Application for Combustion Turbine 3
Equipment Building ("CT3 Equipment Building") and
Demolition of the Existing Steam Plant Building at the Charlottetown Plant Site***

In response to the Commission's letter dated November 23, 2020, the Company is filing the attached Application for approval to construct a CT3 Equipment Building and approval to demolish the existing Steam Plant Building at the Charlottetown Plant Site.

As requested by the Commission and in support of the application, a long-term plan for the Charlottetown Plant Site is provided as Appendix A. The Charlottetown Plant Site is, and will continue to be, a key location in the Company's long-term plan serving as a transmission hub, distribution centre and generation station for decades to come.

An electronic copy will follow. If you require further information, please do not hesitate to contact me at (902) 629-3701.

Yours truly,

MARITIME ELECTRIC

Michelle Francis
Vice President, Finance & Chief Financial Officer

MF26
Attachments

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 17(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2021 Supplemental Capital Budget Request for the construction of a Combustion Turbine 3 Equipment Building.

AND

IN THE MATTER of Section 26(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the demolition of the existing Steam Plant Building at the Charlottetown Plant Site as presented in the Charlottetown Thermal Generating Station Decommissioning Study filed with the Commission on June 28, 2018.

**APPLICATION AND EVIDENCE
OF
MARITIME ELECTRIC COMPANY, LIMITED**

June 8, 2021

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APPENDICES

Appendix A	Charlottetown Plant Site Long-Term Plan
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SECTION 1.0 - APPLICATION

1.0 APPLICATION

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 17(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2021 Supplemental Capital Budget Request for the construction of a Combustion Turbine 3 Equipment Building.

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Introduction

1. Maritime Electric Company, Limited ("Maritime Electric" or the "Company") is a Corporation incorporated under the laws of Canada with its head or registered office at Charlottetown and carries on a business as a public utility subject to the Electric Power Act (the "Act") engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.

SECTION 1.0 - APPLICATION

Application

2. Maritime Electric hereby applies for an order of the Island Regulatory and Appeals Commission approving a Supplemental Capital Budget Request for 2021 as outlined in the attached evidence.

3. Maritime Electric hereby applies for an order of the Commission approving the demolition of the existing Steam Plant Building at the Charlottetown Plant Site in accordance with the Charlottetown Thermal Generating Station filed with the Commission on June 28, 2018.

4. The proposals contained in this Application represent a just and reasonable balance of the interests of Maritime Electric and those of its customers. If approved, the Company will undertake the necessary capital additions and improvements at a cost that is, in all circumstances, reasonable.

Procedure

5. Filed hereto is the Affidavit of Jason C. Roberts, T. Michelle Francis, Angus S. Orford and Enrique A. Riveroll which contains the evidence on which Maritime Electric relies in this Application.

Dated at Charlottetown, Province of Prince Edward Island, this 8th day of June, 2021.



D. Spencer Campbell, Q. C.

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Solicitors for Maritime Electric Company, Limited

SECTION 2.0 - AFFIDAVIT

2.0 AFFIDAVIT

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 17(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2021 Supplemental Capital Budget Request for the construction of a Combustion Turbine 3 Equipment Building.

AND

IN THE MATTER of Section 26(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the demolition of the existing Steam Plant Building at the Charlottetown Plant Site as presented in the Charlottetown Thermal Generating Station Decommissioning Study filed with the Commission on June 28, 2018.

AFFIDAVIT

We, Jason Christopher Roberts of Suffolk, T. Michelle Francis of Emyvale, Angus Sumner Orford of Charlottetown and Enrique Alfonso Riveroll of New Dominion, in Queens County, Province of Prince Edward Island, MAKE OATH AND SAY AS FOLLOWS:

1. We are the President and Chief Executive Officer, Vice-President, Finance and Chief Financial Officer, Vice-President, Corporate Planning and Energy Supply and Vice-President, Customer Service of Maritime Electric respectively and, as such, have personal knowledge of the matters deposed to herein, except where noted, in which case we rely

SECTION 2.0 - AFFIDAVIT

upon the information of others and in which case we verily believe such information to be true.

2. Maritime Electric is a public utility subject to the provisions of the Electric Power Act engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.

3. We prepared or supervised the preparation of the evidence and to the best of our knowledge and belief the evidence is true in substance and in fact.

4. Section 7.0 contains a proposed Order of the Commission based on the Company's Application.

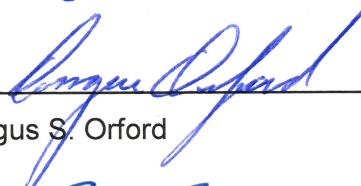
SWORN TO SEVERALLY at
Charlottetown, Province of Prince Edward Island,
the 8th day of June, 2021.
Before me:



Jason C. Roberts



T. Michelle Francis



Angus S. Orford



Enrique A. Riveroll



A Commissioner for taking Affidavits
in the Supreme Court of Prince Edward Island.

3.0 EXECUTIVE SUMMARY

3.1 Introduction

Maritime Electric Company, Limited (“Maritime Electric” or the “Company”) submits this Supplemental Capital Budget Request application (“Application”) seeking approval from the Island Regulatory and Appeals Commission (“IRAC” or the “Commission”) to construct a building to house equipment related to the operation of combustion turbine #3¹ (“CT3 Equipment Building”) for an estimated budget cost of \$4.2 million. This Application includes the Company’s Charlottetown Plant Site Long-Term Plan, herein attached as Appendix A, which provides a clear plan for the ongoing and future use of the Charlottetown Plant Site (“Plant Site”) and supports the construction of the CT3 Equipment Building. This Application explains how this new facility will meet the current and future needs of the Company.

The Company is also requesting approval of the demolition of the existing Steam Plant Building at the Charlottetown Plant Site as presented in the Charlottetown Thermal Generating Station Decommissioning Study filed with the Commission on June 28, 2018.

3.2 Charlottetown Plant Site Long-Term Plan

As discussed in Section 6.7, the Federal Energy Regulatory Commission (“FERC”) uniform system of accounts (“USOA”) permits utility assets held for future use². Specifically, FERC permits utilities to hold land for future use, whether acquired but never used by the utility in electric service or whether previously held in service but retired from service, provided the land is held pending its use in electric service in the future under a plan.

The Plant Site is, and will continue to be, a key location in the Company’s long-term plan³. The electricity system requires a strong, reliable generation source to accommodate the Charlottetown area’s continued electrification of space heating and the trend towards electrified transportation, and the Plant Site is the optimal location. In addition, the size of

¹ A 50 megawatt General Electric LM6000PC combustion turbine.

² In the United States, the FERC requires public utilities to maintain their books and records in accordance with their USOA. In the absence of specific accounting guidance in Canada, following the FERC USOA and accounting guidelines is considered good utility practice in Canada. Account 105 of the USOA specifically defines Electric plant held for future use.

³ Serving as a transmission hub, distribution centre and generation station for decades to come.

SECTION 3.0 – EXECUTIVE SUMMARY

the Plant Site will allow the Company to execute its long-term plans for the Charlottetown area without having to find and secure another suitable piece of land.

The Plant Site will undergo significant change over the next fifteen years to address customer needs, including the decommissioning and removal of the building that houses the thermal generation units CTGS #9 and CTGS #10 (“Steam Plant Building”), the addition of a second combustion turbine, the replacement of the existing 69 kV substation, the installation of energy storage infrastructure, and the addition of a 138 kV substation.

Over the next fifteen years, the Company’s need for a new building at the Plant Site is limited to the CT3 Equipment Building as requested in this Application.

Section 5.0 of this Application summarizes the key aspects of the Company’s current long-term plans for the Plant Site, which illustrate that the demolition of the Steam Plant Building and the construction of the CT3 Equipment Building is still in the best interest of customers.

3.3 CT3 Equipment Building

Construction of the new CT3 Equipment Building continues to be the least-cost option for addressing the need to relocate equipment associated with the operation of CT3 from the Steam Plant Building prior to its demolition, as discussed in Section 6.1 of this Application.

The estimated capital cost to construct the CT3 Equipment Building has increased to \$4,168,000, up approximately 11 per cent from \$3,755,000 originally requested in the 2020 Capital Budget Application, and is further discussed in Sections 6.2 and 6.3 of this Application.

The schedule for constructing the CT3 Equipment Building is dependent on when and if approval to proceed is granted by the Commission, and is further discussed in Sections 6.4, 6.5 and 6.6 of this Application.

The Company’s long-term plan for the Plant Site demonstrates that the entire site is critical to the continued provision of service. With respect to the land on which the Steam Plant Building is located, the majority of the land is leased from The Cumberland Trust with the remaining small portion of land owned by Maritime Electric. As discussed in Section 6.7

SECTION 3.0 – EXECUTIVE SUMMARY

of this Application, the entire Plant Site along with the owned and leased land are and will continue to be used and useful for the foreseeable future.

4.0 INTRODUCTION

4.1 Corporate Profile

Maritime Electric owns and operates a fully integrated system providing for the purchase, generation, transmission, distribution and sale of electricity throughout Prince Edward Island (“PEI”). The Company’s head office is located in Charlottetown with generating facilities in Charlottetown and Borden-Carleton.

Maritime Electric is the primary provider of electricity on PEI, delivering approximately 90 per cent of the energy supplied in the province. To meet customers’ energy demand and supply requirements, the Company has a contractual entitlement to capacity and energy from NB Power’s Point Lepreau Nuclear Generating Station (“Point Lepreau”) and an agreement for the purchase of capacity and system energy from NB Power delivered via four submarine cables leased from the Province of PEI. Through various contracts with the PEI Energy Corporation, the Company purchases the capacity and energy from 92.5 megawatts (“MW”) of wind generation on PEI.

Maritime Electric is a public utility subject to the PEI Electric Power Act. As a public utility, the Company is subject to regulatory oversight and approvals of the Commission. IRAC’s jurisdiction to regulate public utilities is found in the Electric Power Act and the Island Regulatory and Appeals Commission Act.

4.2 Purpose

Maritime Electric submits this Application seeking approval to construct the CT3 Equipment Building to house equipment related to the operation of combustion turbine #3 for the estimated capital cost of \$4.2 million. This Application includes the Company’s Charlottetown Plant Site Long-Term Plan, herein attached as Appendix A, which provides a clear plan for the future use of the Plant Site and supports the construction of the CT3 Equipment Building. This Application explains how this new facility will meet the current and future needs of the Company.

SECTION 4.0 – INTRODUCTION

4.3 History

On June 28, 2018, the Company filed a Charlottetown Thermal Generating Station (“CTGS”) Decommissioning Study, which provided a detailed assessment of the decommissioning process, options, risks and estimated costs related to the proposed plan for the facility. The CTGS Decommissioning Study was consolidated, by IRAC, with the General Rate Application covering the period of 2019 to 2022 (“2019 GRA”).

During the 2019 GRA, the Commission retained Synapse Energy Economics, Inc. (“Synapse”) to evaluate the CTGS Decommissioning Study. Maritime Electric responded to various interrogatories from Synapse, providing additional evidence, and Synapse provided recommendations to the Commission.

On April 23, 2019, Maritime Electric filed with the Commission its 2020 Capital Budget Application, including the requested approval to construct the CT3 Equipment Building (previously referred to as the CT3 Balance of Plant Equipment Building or BOP) for \$3.755 million⁴.

On September 27, 2019, IRAC issued Order UE19-08 indicating that it did not approve the demolition of the Steam Plant Building or the construction of the CT3 Equipment Building. However, the Commission indicated it was open to the Company seeking approval once a clear plan for the future use of the Plant Site has been established.

On December 9, 2019, IRAC issued Order UE19-09 that did not approve the capital budget for the CT3 Equipment Building.

In accordance with Order UE19-08, the Company filed semi-annual reports updating the Commission on the decommissioning activities. Semi-annual decommissioning reports were filed on June 5, 2020, October 30, 2020 and May 20, 2021.

After reviewing the Commission’s findings in Order UE19-08 related to the CTGS decommissioning and construction of the CT3 Equipment Building, the Company believed that the Commission considered the retention of the Steam Plant Building for future use

⁴ Refer to Section 4.4 of this Application for clarification on the estimated cost of the CT3 Equipment Building.

SECTION 4.0 – INTRODUCTION

as a viable option. Therefore, included in the semi-annual report filed on June 5, 2020, the Company requested approval of \$401,000 for a structural assessment and National Building Code of Canada (“NBCC”) review to address the Synapse recommendations referenced in paragraphs 216 (2) and (3) of Order UE19-08. It was, and is, the Company’s position that such an assessment would clearly demonstrate that retaining the Steam Plant Building for future use is not a cost-effective option.

On September 30, 2020, Maritime Electric filed its 2020 Integrated System Plan, which details a Generation Resource Adequacy analysis⁵ and how the Plant Site is the best location on PEI for new on-Island generation⁶.

In a letter dated November 23, 2020, the Commission indicated that it was not necessary to proceed with the NBCC review. Instead, the Commission requested that the Company file an application detailing the plan for the Plant Site, which would include a detailed 5 to 15 year plan for the site, including information to support the site remaining in rate base and demonstrating how the site is used and useful going forward. In addition, if a new facility is to be built on site, the Company is to explain how this new facility will meet the current and future needs of the Company.

4.4 Clarifications

The Company would like to provide some clarifications concerning the Commission’s interpretation of certain aspects of the CTGS decommissioning. The paragraph references that follow in this section refer to Order UE19-08.

Paragraphs 204, 205 and 206 indicate that *“CT3 and the ECC [Energy Control Centre] are housed in the Steam Plant Building”* and Maritime Electric *“proposes to demolish the entire Steam Plant Building”* and that *“once the Steam Plant Building is demolished, CT3 and the ECC will be relocated to a new balance of plant building⁷”*. Neither CT3 nor the ECC are located in the Steam Plant Building. The ECC is actually in a separate building that is adjacent to the Steam Plant Building, refer to Figure 1 in Appendix A. The ECC does not need to be relocated and can remain in place even during the demolition. CT3 is

⁵ Refer to Section 7 of the Integrated System Plan.

⁶ Refer to Section 10 of the Integrated System Plan.

⁷ The balance of plant building “BOP” is now referred to as the CT3 Equipment Building.

SECTION 4.0 – INTRODUCTION

located approximately 100 feet from the Steam Plant Building in a self-contained structure. Only certain equipment related to the operation of CT3⁸ is currently located inside the Steam Plant Building and needs to be relocated to the new CT3 Equipment Building. In addition, the relocation of the CT3 equipment will need to be completed before, not after, demolition of the Steam Plant Building begins to protect employees and the equipment, and ensure availability of CT3.

Paragraphs 206 and 209 indicate that the “*cost to construct the new [CT3 Equipment Building] to be approximately \$3.2 million*”. This statement is partly true but is incomplete. The cost estimate to construct the CT3 Equipment Building provided by CBCL Limited was \$3.151 million, before contingency costs and design fees, and includes costs related to the retirement of assets. Section 6.2 of this Application provides a more detailed discussion of the CBCL Limited cost estimate dated May 30, 2019 and provides a reconciliation to the \$3.755 million requested in the 2020 Capital Budget Application.

Since that time, the Company has obtained an updated cost estimate to construct the CT3 Equipment Building which is discussed in Section 6.3 of this Application.

Paragraph 209 indicates that decommissioning activities will be completed by late 2023. As discussed in Section 6.4 of this Application, decommissioning activities are now expected to be completed by 2024.

Paragraph 211 indicates that the Company requested “*that the Commission deem the entire CTGS site to be used and useful following the decommissioning*”. The comment that the Plant Site should be “deemed” used and useful implies that there is uncertainty concerning its purpose in providing service to customers now and in the future. The Company has presented evidence that the entire Plant Site is, and will continue to be, used and useful. The long-term plan for the Plant Site, attached herein as Appendix A, summarizes that evidence.

⁸ Equipment related to the operation of CT3 includes: (i) 600 volt motor control center, switch gear and electrical distribution equipment; (ii) two 900 kVA Dorman diesel black start generators, automatic transfer switch and switchgear; (iii) 1.5 MVA station service transformer; (iv) reverse osmosis water treatment plant with water storage tank; (v) waste water treatment facilities; (vi) two instrument air compressors and associated equipment; and (vii) spare parts.

SECTION 4.0 – INTRODUCTION

Section 6.7 of this Application further discusses why the land where the Steam Plant Building resides continues to be used and useful.

SECTION 5.0 – CHARLOTTETOWN PLANT SITE LONG-TERM PLAN

5.0 CHARLOTTETOWN PLANT SITE LONG-TERM PLAN

Maritime Electric's long-term plan for the Plant Site is attached herein as Appendix A.

The Plant Site is, and will continue to be, a key location in the Company's long-term plan serving as a transmission hub, distribution centre and generation station for decades to come. The electricity system requires a strong, reliable generation source to accommodate the Charlottetown area's continued electrification of space heating and the trend towards electrified transportation, and the Plant Site is the optimal location. In addition, the size of the Plant Site will allow the Company to execute its long-term plans for the Charlottetown area without having to find and secure another suitable piece of land.

The Plant Site will undergo significant change over the next fifteen years to address customer needs, including the decommissioning and removal of the Steam Plant Building, the addition of a second combustion turbine, the replacement of the existing 69 kV substation, the installation of energy storage infrastructure, and the addition of a 138 kV substation.

Over the next fifteen years, the Company's need for a new building at the Plant Site is limited to the CT3 Equipment Building as requested in this Application, and its potential future expansion for CT4.

The Company's long-term plan currently indicates that additional generating capacity in the form of a combustion turbine, to be known as CT4, will be required by 2024⁹ and the related equipment will need to be housed in a building. However, the Company plans to build an extension onto the CT3 Equipment Building to accommodate the CT4 equipment. It should be noted that the ownership and location of any future generating capacity is uncertain¹⁰, and this uncertainty is the main reason why the Company's plan is to extend the CT3 Equipment Building if and when an additional combustion turbine is approved by the Commission.

⁹ The Company's response to 2021 Capital Budget Application IR-4 and IR-8 did not include the anticipated addition of CT4 due to the uncertainty concerning its ownership.

¹⁰ Effective December 20, 2017 under Section 17.1 of the Electric Power Act, the PEI Energy Corporation has the option to own any new generating equipment or additional generating capacity if so ordered by the Government of PEI.

SECTION 5.0 – CHARLOTTETOWN PLANT SITE LONG-TERM PLAN

The following is a summary of the key aspects of the Company's long-term plan for the Plant Site, which illustrate that the demolition of the Steam Plant Building and the construction of the CT3 Equipment Building is still in the best interest of customers.

In 2022 a new building is required to house the CT3 equipment, which must be removed from the existing Steam Plant Building prior to the building's demolition. Support for the construction of the CT3 Equipment Building is provided in Section 6.0 of this Application.

In 2023 the Steam Plant Building and associated stacks will be substantially demolished along with the River Pumphouse, some of the underground cooling water pipes that currently connect the CTGS to the River Pumphouse, and the five million litre bunker C fuel oil tank.

By 2024 new on-Island dispatchable generating capacity will be required. The Company's analysis to date indicates that a new combustion turbine, CT4, will be the optimal source for that required capacity, which will also serve to replace the capacity lost with the closure of CTGS. Furthermore, the Plant Site has been identified as the prime location for the new capacity. The decommissioning of the CTGS and demolition of the Steam Plant Building will create sufficient space that will be required as a laydown area¹¹ during the assembly of CT4.

The addition of CT4 will also require associated equipment, a step up transformer and a new fuel storage tank. An expansion of the CT3 Equipment Building is the preferred option to house some of the associated equipment. The planned placement of the CT3 Equipment Building allows the required space for this future expansion¹². The Plant Site also has sufficient space for the placement of the required step up transformer and a new fuel storage tank¹³.

By 2030 the existing Charlottetown 69 kV substation is expected to reach its end of life and require replacement. The critical nature of this substation will require it to be replaced versus rebuilt and the Plant Site allows sufficient space to accommodate this.

¹¹ A laydown area is an area used for the receipt, temporary storage, and sometimes for the assembly of construction equipment and other supplies.

¹² The Company considered constructing the CT3 Equipment Building to be large enough to house the future equipment related to CT4; however, this option was rejected as it would result in having a portion of an asset that is not used and useful for a number of years and there is uncertainty concerning the ownership of CT4.

¹³ The existing fuel containment facility used for CT3 will also be used for CT4, and is another reason why the Plant Site is the optimal location for future generating capacity.

SECTION 5.0 – CHARLOTTETOWN PLANT SITE LONG-TERM PLAN

Energy storage infrastructure (e.g., battery storage) may approach economic viability by the end of 2030. The Company's long-term plan is to use the land previously occupied by the Steam Plant Building, and used as the laydown area for the assembly of CT4, as the site for future energy storage.

By 2035 load growth in the Charlottetown area may reach or exceed the capacity of the existing electricity system. To address this, the Company plans to add a 138 kV substation at the Plant Site, and the transmission lines will be upgraded accordingly.

6.0 CT3 EQUIPMENT BUILDING

6.1 Least-Cost Option

Since 2005, equipment related to the operation of CT3 has been located in the Steam Plant Building, while CT3 is located in a separate structure approximately 100 feet to the north of the Steam Plant Building. During the decommissioning study phase, it became evident that once the Steam Plant Building reaches its end of life it would be cost prohibitive to continue to use it, or any portion thereof, to continue to house the CT3 equipment. The expert advice provided by GHD Engineering, the engineering firm that completed the CTGS decommissioning plan, indicated that the full demolition of the Steam Plant Building and construction of a new CT3 Equipment Building would be cheaper than retaining and upgrading a portion of the Steam Plant Building to continue to house the equipment.

Further analysis determined that the cost differential between retaining the Steam Plant Building for future use and constructing a new CT3 Equipment Building was even greater than originally estimated. Fitzgerald and Snow (2010) Ltd. completed a constructability review in April 2020 that identified additional evidence that retaining the Steam Plant Building for future use is cost prohibitive. This analysis indicated that significant and expensive rebuilding of the building's structure would be required, including: (i) replacing unreinforced masonry, speed tiles and brick walls; (ii) installing additional steel piles; (iii) replacing the roof; and (iv) raising the elevation of the ground floor of the building to meet flood elevation requirements. The Company provided this evidence to the Commission as part of the semi-annual decommissioning report filed on June 5, 2020.

Although the Commission's consultant, Synapse, did not visit the Plant site in developing evidence for the Commission, both GHD Engineering and Fitzgerald and Snow conducted on-site visual inspections and assessments of the Steam Plant Building condition and both concluded that retaining the building was not a viable option.

Therefore, it is still the Company's position that the least-cost option is to construct the CT3 Equipment Building.

SECTION 6.0 – CT3 EQUIPMENT BUILDING

6.2 2020 Capital Budget Amount

In Section 4.1 (a) of the 2020 Capital Budget Application, the Company requested approval of \$3,691,000 to construct the CT3 Equipment Building and Table 1 shows the calculation of this amount. An additional \$64,000 was included in the budget for Interest During Construction (“IDC”) in Section 9.0 of the 2020 Capital Budget Application.

Table 1	
2020 Capital Budget Amount for CT3 Equipment Building	
	<i>(\$ millions)</i>
Construction estimate before contingency costs and design fees	\$ 3,151
Contingency costs and design fees	1,068
Total estimate provided by CBCL Limited	4,219
Less: retirement labour costs	(634)
Subtotal in 2019 \$	3,585
Add: 3% inflation	106
2020 Subtotal Section 4.1(a) CT3 Balance of Plant Building	3,691
Add: Section 9.0 IDC Applicable to Balance of Plant Building ¹⁴	64
2020 Capital Budget Amount	\$ 3,755

The estimate provided by CBCL Limited is an AACE Class 1 estimate that was provided on May 16, 2019¹⁵. The total estimate of \$4,219,000 included labour costs of \$634,000 related to the removal of piping, valves, cabling and instrumentation, associated with the CT3 equipment that will not be reused and must be retired. The Company determined that those costs belonged in the decommissioning estimate rather than in the new building estimate and, therefore, deducted them from the amount requested in the 2020 Capital Budget Application.

6.3 Updated Construction Estimate

Given that the CBCL Limited estimate was provided in 2019, Maritime Electric obtained an updated estimate dated March 26, 2021 and is attached herein as Appendix C.

The cost estimate increased from \$4,219,000 by approximately 13 per cent to \$4,778,000 due to increases in the cost of materials and labour, reflecting current market conditions.

¹⁴ The 2020 capital budget for IDC of \$563,000 included \$64,000 of IDC applicable to the proposed CT3 Balance of Plant Building project (i.e., the CT3 Equipment Building).

¹⁵ The estimate was provided to the Commission as attachment 2 to the Company’s response to Synapse IR-3, and is provided herein as Appendix B for ease of reference.

SECTION 6.0 – CT3 EQUIPMENT BUILDING

As noted in the quote, there are a number of tangible and intangible factors associated with increasing upward pressure on probable construction costs, including:

- Material costs have increased significantly in the last two years, impacted by the pandemic;
- Labour rates for electrical and mechanical trades persons have increased over the last two years by approximately 7 per cent, and may exceed this rate depending on the ultimate availability of Red Seal trades people;
- Labour rates for other skilled labour have increased by 2 to 3 per cent; and
- A productivity factor for all trades is assumed to be 70 per cent, down from 85 per cent in the 2019 quote, as this project is expected to be complex in the required sequencing which may require extended or overtime hours to complete. The productivity factor has decreased because of the aging work force, and scarcity of trades people and site supervisors.

Table 2 reconciles the updated quote to the amount requested in the Application.

Table 2 2021 SCBR Amount for CT3 Equipment Building	
	<i>(\$ millions)</i>
Construction estimate before contingency costs and design fees	\$ 3,638
Contingency costs and design fees	1,140
Total estimate provided by CBCL Limited	4,778
Less: retirement labour costs	(678)
Subtotal before IDC	4,100
Add: IDC on CT3 Equipment Building ¹⁶	68
2021 SCBR Amount	\$ 4,168

6.4 Schedule Scenarios

When requested as part of the 2020 Capital Budget Application, it was anticipated that Commission approval in late 2019 would have allowed the remaining engineering design work along with the tendering and awarding of the construction contract to be completed in the first quarter of 2020. This would have allowed the construction of the building to be

¹⁶ IDC = \$4.1 million x 2021 forecast average return on rate base of 6.74% x 90/365 day average expected construction period.

SECTION 6.0 – CT3 EQUIPMENT BUILDING

completed between April and September 2020, and then the CT3 equipment would have been relocated from the Steam Plant Building into the new building between September and October 2020. The demolition of the Steam Plant Building would begin in early 2022¹⁷. This schedule would have also avoided the need to heat the Steam Plant Building during the winter of 2021/2022¹⁸, which is estimated to cost approximately \$500,000 in annual operating expense.

In accordance with the Energy Purchase Agreement with NB Power, any decommissioning schedule must ensure that CT3 is operational during the winter operating period, November 1 to March 31, and New Brunswick's spring run-off period, April 1 to June 15. In addition, the relocation of the CT3 equipment from the Steam Plant Building to the new CT3 Equipment Building will require a three month outage on CT3, which therefore must commence after June 15 and end before November 1.

Due to the regulatory process related to this issue extending longer than originally anticipated, the Company offers two schedule scenarios. The first scenario requires an acceleration of the remaining regulatory process, the remaining engineering design work and the first stage of the building construction, which may allow the cost of heating the Steam Plant Building during the winter of 2022/2023 to be avoided.

Under the first scenario, Commission approval would be required by July 15, 2021. The remaining engineering design work along with the tendering and awarding of the construction contract would be completed in July to September 2021. This would allow the steel piles to be installed and the concrete floor to be poured during the fall before the ground is frozen¹⁹. Then, during the winter and spring periods, the building's exterior could be completed and the interior work started. This would allow the CT3 equipment to be relocated from the Steam Plant Building into the partially constructed new building during the summer of 2022, and avoid the need to heat the Steam Plant Building during the winter of 2022/2023. Then the demolition of the Steam Plant Building could begin as soon as the CT3 equipment is removed.

¹⁷ Demolition cannot begin before January 1, 2022 as CTGS#9 and #10 need to be available for service until the end of 2021 in accordance with the current Energy Purchase Agreement with NB Power.

¹⁸ The Steam Plant Building must be heated during the winter season to ensure the pipes supplying water to CT3 do not freeze.

¹⁹ Installation of the steel piles and pouring the concrete floor before the ground is frozen by December 2021 is the critical aspect to the first scenario's schedule.

SECTION 6.0 – CT3 EQUIPMENT BUILDING

Under the second scenario, the regulatory process cannot be completed by July 15, 2021. The remaining engineering design work along with the tendering and awarding of the construction contract would be completed by the first quarter of 2022. Construction of the new building would begin in April 2022, once the ground is no longer frozen, and completed by December 2022. Then the CT3 equipment would be relocated from the Steam Plant Building into the new building between June and October 2023, allowing demolition of the Steam Plant Building to begin in late 2023. The Steam Plant Building would need to be heated during the winter of 2022/2023 to ensure the pipes supplying water to the CT3 equipment do not freeze. Final site restoration would then be completed in 2024.

Since the Commission's consultant on this matter did not conduct a visual on-site inspection of the Plant Site, the Company would like to invite the Commission to conduct an on-site visit of the Plant Site to facilitate the remaining regulatory process. As per the Commission's Rules of Practices & Procedure, item 8, *"The Commission, in its sole discretion and having informed the parties, may conduct an on-site view of lands or facilities to gain knowledge pertaining to any matter relevant to the disposition of a hearing."*

The Company believes that such an on-site visual assessment will enable the Commission to quickly conclude that retention of any portion of the Steam Plant Building is not viable.

6.5 Planned Schedule

The following proposed schedule assumes the first schedule scenario discussed above, being the Company's preferred schedule. It should be noted that the work to be completed remains the same regardless of the timeframe.

The completion of the building design and tendering of the project is proposed to occur between July and September of 2021. This includes:

- Application for demolition and building permits from the City of Charlottetown;
- Completion of the detailed engineering for the CT3 Equipment Building²⁰;

²⁰ In order for CBCL Limited to complete the AACE Class 1 estimate in 2019, at least 50 per cent of the engineering design needed to be completed; therefore, the remaining engineering design needs to be completed.

SECTION 6.0 – CT3 EQUIPMENT BUILDING

- Preparation of tender documents;
- Tendering and contractor(s) selection; and
- Review of shop and contractor drawings.

Construction of the building is proposed to commence in the fall of 2021. This includes:

- Installation of steel piles and pile caps;
- Installation of grade beams;
- Installation of steel reinforced concrete slabs;
- Installation of buried infrastructure; and
- Miscellaneous civil works.

The remainder of the building is proposed to be constructed in the winter and spring of 2022. This includes:

- Construction of civil, structural and architectural above ground components of the building;
- Work from mechanical, instrumentation, and electrical trades to install process equipment, piping and instrumentation; and
- Installation of electrical cabling and wiring to connect equipment.

The relocation of the CT3 equipment (mechanical and electrical) from the Steam Plant Building into the new CT3 Equipment Building is proposed to occur during a three-month outage of CT3 in the summer of 2022. This outage will be required to disconnect and move the equipment, and reconnect and re-commission the equipment. This outage cannot occur between November 1, 2021 and June 15, 2022 due to the contractual requirement for CT3 to be available during the winter operating season of November 1 to March 31, 2022 and likewise available from April 1 to June 15, 2022 to provide non-spinning reserve. This includes:

- Relocation of mechanical equipment;
- Completion of connections of the mechanical equipment;
- Relocation of electrical equipment;
- Completion of connections of the electrical equipment; and
- Commissioning of mechanical and electrical equipment.

SECTION 6.0 – CT3 EQUIPMENT BUILDING

6.6 Proposed Capital Budget Additions

If approval to proceed with the construction of the CT3 Equipment Building is received by July 15, 2021 then the project will span two years. Table 3 illustrates the proposed capital additions in 2021 and 2022. It should be noted that the Company is requesting approval of the entire project amount regardless of whether is it completed over 2021 and 2022 or fully completed in 2022.

Description	Total SCBR Application
Year 1 – Steel Piles and Concrete Floor	\$ 1,000,000
Year 2 – Balance of Exterior and Interior Construction	3,100,000
IDC	68,000
TOTAL	\$ 4,168,000

6.7 Land to Remain in Rate Base

The FERC USOA addresses assets held for future use in its definition of “*Electric plant held for future use*” which states that “*this account shall also include the original cost of land and land rights owned and held for future use in electric service under a plan for such use, to include land and land rights: (1) acquired but never used by the utility in electric service, but held for such service in the future under a plan, and (2) previously held by the utility in service, but retired from such service and held pending its reuse in the future under a plan, in electric service*”.

The Company’s long-term plan for the Plant Site demonstrates that the entire site is critical to the continued provision of service. With respect to the land on which the Steam Plant Building is located, the majority of the land is leased from The Cumberland Trust²¹ with the remaining small portion of land owned by Maritime Electric, as illustrated in Figures 1 and 3 in Appendix A. This land, both the leased and owned portions, will serve as an equipment laydown area during the installation of CT4 and later be used to locate energy storage infrastructure.

²¹ The Cumberland Trust Land Lease, a 999 year lease, was signed in 1853 between Bentinck Harry Cumberland and the Charlottetown Gas Light Company to allow for the construction of a coal gas production facility, which was used for street lighting in downtown Charlottetown. Presently, 831 years remain on the land lease which costs ratepayers approximately \$3,500 annually.

SECTION 6.0 – CT3 EQUIPMENT BUILDING

Removing the portion of owned land upon which the Steam Plant Building is located from rate base, after the Steam Plant Building is demolished, should only be considered if there were no future use for the land. Furthermore, regardless of the fact that the Company has identified a future use for the land, the owned land in question is too small to be subdivided (i.e., separated from the remainder of the property) and sold or given over to other non-utility uses. The entire square footage of the owned land is used and useful and should remain in rate base.

7.0 PROPOSED ORDER

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 17(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the 2021 Supplemental Capital Budget Request for the construction of a Combustion Turbine 3 Equipment Building.

AND

IN THE MATTER of Section 26(1) of the Electric Power Act (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving the demolition of the existing Steam Plant Building at the Charlottetown Plant Site as presented in the Charlottetown Thermal Generating Station Decommissioning Study filed with the Commission on June 28, 2018.

UPON receiving an Application by Maritime Electric Company, Limited (the “Company”) for approval of the Company’s Supplemental Capital Budget Request for 2021;

AND UPON considering the Application and Evidence filed in support thereof;

NOW THEREFORE, for the reasons given in the annexed Reasons for Order and pursuant to the Electric Power Act;

SECTION 7.0 – PROPOSED ORDER

IT IS ORDERED THAT

1. The 2021 Supplemental Capital Budget Request for the construction of a Combustion Turbine 3 Equipment Building, filed herein on June 8, 2021 and summarized below is approved:

Table 4			
Proposed SCBR CT3 Equipment Building			
Description	2021	2022	Total
Year 1 - Steel Piles and Concrete Floor	\$ 1,000,000	\$ -	\$ 1,000,000
Year 2 - Balance of Exterior and Interior Construction	-	3,100,000	3,100,000
IDC	-	68,000	68,000
TOTAL	\$ 1,000,000	\$ 3,168,000	\$ 4,168,000

2. The demolition of the existing Steam Plant Building at the Charlottetown Plant Site as presented in the Charlottetown Thermal Generating Station Decommissioning Study filed with the Commission on June 18, 2018 is approved.

DATED at Charlottetown, Prince Edward Island, this ___ day of _____, 2021.

BY THE COMMISSION:

Chair

Commissioner

Commissioner

APPENDIX A

Charlottetown Plant Site Long-Term Plan

**All our energy.
All the time.**



Charlottetown Plant Site Long-Term Plan

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1.0 EXECUTIVE SUMMARY

The Charlottetown Plant site (“Plant Site”) is, and will continue to be, a key location in Maritime Electric’s (the “Company”) long-term plan. The electricity system requires a strong, reliable generation source to accommodate the Charlottetown area’s continued electrification of space heating and the trend towards electrified transportation, and the Plant Site is the optimal location. In addition, the size of the Plant Site will allow the Company to execute its long-term plans for the Charlottetown area without having to find and secure another suitable piece of land.

The Plant Site will undergo significant change over the next fifteen years to address customer needs, including the decommissioning and removal of the Charlottetown Thermal Generating Station (“CTGS”) building (“Steam Plant Building”) and related facilities, the addition of a second combustion turbine, the replacement of the existing 69 kilovolt (“kV”) substation, the installation of energy storage infrastructure, and the addition of a 138 kV substation.

By 2035, Maritime Electric expects the Plant Site to house the following existing and future facilities:

Existing Facilities	<ul style="list-style-type: none"> ▪ Energy Control Centre (“ECC”) building ▪ Combustion turbine #3 (“CT3”) and associated step up transformer ▪ Fuel storage, containment and offloading facility ▪ 69 kV substation and substation control building ▪ 69 kV capacitor bank ▪ Machine shop ▪ Storage building
Future Facilities	<ul style="list-style-type: none"> ▪ New building to house the CT3 equipment (“CT3 Equipment Building”) ▪ Combustion Turbine #4 and related equipment ▪ Energy storage infrastructure ▪ 138 kV substation

The plans presented herein are based on the best information available at this time. As new information becomes available and as conditions change, the Company will continue to assess the needs of its customers and how best to serve those needs. Such

Charlottetown Plant Site Long-Term Plan

assessments may result in the plans presented herein being adjusted as the circumstances dictate.

2.0 BACKGROUND

Maritime Electric and its predecessors have used the Plant Site for over 150 years¹. When Maritime Electric purchased the Charlottetown Light & Power Company, it assumed the remaining portion of a 999-year lease² for 1.2 acres of land at the corner of Sydney and Cumberland Streets that now forms part of the Plant Site. Maritime Electric owns the remainder of the Plant Site land.

The oldest facilities still existing at the Plant Site date back to the 1920s. A majority of the Steam Plant Building is located on the leased property known as the Cumberland Trust Land, as shown in Figure 1 attached herein. Decommissioning the CTGS equipment in 2022 to 2024³ presents an opportunity to evaluate the site's long-term usage.

Maritime Electric sought approval from the Island Regulatory and Appeals Commission ("IRAC" or the "Commission") to demolish the Steam Plant Building⁴ because its current condition is a long-term safety risk and cost liability⁵. Although theoretically it is possible to keep a portion of the building intact to house future on-site generation, expert assessments based on on-site inspections, which have been previously filed with the Commission, have determined that it is cost prohibitive to do so.

¹ The Cumberland Trust Land Lease was signed in 1853 between Bentinck Harry Cumberland and the Charlottetown Gas Light Company to allow for the construction of a coal gas production facility, which was used for street lighting in downtown Charlottetown.

² Presently, 831 years remain on the land lease at an annual cost of \$3,500.

³ Subject to the timing of approval of the CT3 Equipment Building, the decommissioning of CTGS and the Steam Plant Building may extend past 2023 and into 2024.

⁴ The Company sought approval for demolition of the Steam Plant Building as part of its General Rate Application filed on November 30, 2018 (Docket UE20944) as presented in the Steam Plant Decommissioning Study originally filed on June 28, 2018 (Docket UE23001).

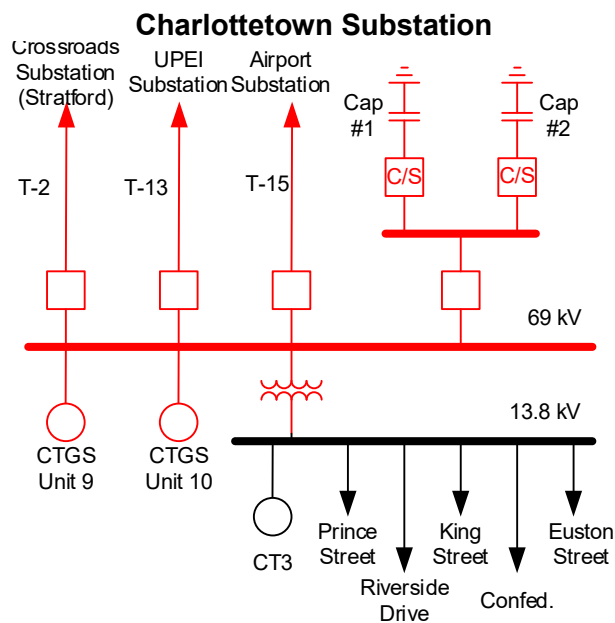
⁵ See R-3 Response to Recommendation 3 (pages 10 – 23) of our General Rate Application Comments on Synapse Energy Economics Inc. Report filed with the Commission on June 5, 2019. Also, summarized in Maritime Electric CTGS Decommissioning Semi-Annual Report, June 2020, as submitted to the Commission on June 5, 2020.

3.0 IMPORTANCE OF PLANT SITE

3.1 Electrical Importance of the Plant Site

The Plant Site is central to Maritime Electric’s generating and system control functions as it is the location of the Charlottetown 69 kV substation, the ECC, and CT3 along with its related equipment and fuel storage.

The Charlottetown 69 kV substation is a key transmission location as it has two 69 kV connections to the West Royalty Substation (with taps to the UPEI and Airport Substations) and one 69 kV connection to eastern PEI via transmission line T-2, which connects to three substations (Crossroads in Stratford, Mount Albion and Lorne Valley).



The five 13.8 kV distribution feeders connected to the Charlottetown 69 kV substation are not fully loaded and can accommodate additional load growth in the downtown and adjacent areas. These feeders also provide backup capabilities to the West Royalty, UPEI and Airport Substations and vice versa.

The anticipated load growth in the Charlottetown area will cause the West Royalty 13.8 kV distribution feeders to have less backup capability for downtown area loads, meaning that backup capability will need to be provided either from a different location or by

Charlottetown Plant Site Long-Term Plan

increasing the capability at the Plant Site. The Company's current plan to address the need for backup capacity is with the addition of a second combustion turbine and associated step up transformer at the Plant Site. Therefore, the Charlottetown substation's critical importance as backup capacity for other substations will increase as load increases.

The ECC is critically important to the operation and efficiency of the electricity system as it houses the operations responsible for scheduling hourly energy purchases, monitoring the Company's distribution and transmission system, managing the submarine cable loading and dispatching on-Island generation when needed.

The location of CT3 at the Plant Site is important because energy produced by CT3 is supplied to the Charlottetown 69 kV substation, which is a transmission hub, with 69 kV connections to both West Royalty as well as eastern PEI via line T-2. In addition, CT3 has a direct connection to the Charlottetown 13.8 kV distribution system, enabling energy supply to five distribution feeders when either the Charlottetown substation or the CT3 step-up transformer is out of service.

3.2 Locational Importance of the Plant Site

Many key public services, including the Charlottetown Wastewater Treatment Plant and the Queen Elizabeth Hospital, are in close proximity to the Charlottetown substation and benefit from the high reliability of this substation. Therefore, the location of the Charlottetown substation and related facilities at the Plant Site is beneficial in providing reliable service to these essential loads in addition to supplying downtown Charlottetown.

The central location, ease of access from major motorways, and close proximity to fuel storage and fuel offloading facilities make the Plant Site an attractive location for future generation. The Plant Site and Charlottetown substation are capable of accommodating an additional combustion turbine in the 50 to 75 megawatt ("MW") size range.

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Furthermore, the Plant Site's proximity to the Charlottetown Harbour and existing rock groyne⁶ provides access to a heat sink should it be required in the future for either energy production or energy storage.

4.0 FUTURE CAPACITY

The capacity lost due to the decommissioning of the CTGS⁷ will need to be replaced in order to maintain a reliable dispatchable backup supply for customers. The Company's analysis to date indicates that a new combustion turbine, to be known as CT4, will be the optimal source for the required capacity, which will be needed by 2024. Its addition will restore the amount of on-Island dispatchable generation and capacity to pre-2016 levels. CT4 will have 10 minute start-up capabilities which results in increased flexibility compared to CTGS, and its increased operating efficiency will ensure its annual operating costs are lower than CTGS. CT4 will also give greater reliability of supply during system contingency and maintenance periods as it does not require a lengthy start-up period.

The need, timing and location of additional on-Island generating capacity after the addition of CT4 will be contingent on many factors, including the remaining lifespan of the existing Borden combustion turbines, CT1 and CT2, and the impact that automated metering infrastructure and time-of-use rates, if implemented, may have on peak mitigation. Generation assets typically have a minimum life of 40 years, however, given the expected operating conditions on PEI (i.e., combustion turbines would be used as backup generation only), new combustion turbines could have an expected life of up to 60 years.

The Company plans to engage an outside expert to investigate and validate the need for additional generating capacity in the form of a combustion turbine and submit an application for Commission approval to install CT4.

⁶ A rock pier that allowed the hot and cold water related to the cooling operations of the CTGS to remain separate.

⁷ Currently there is 40 MW of generating capacity that is in long-term layup and due to be decommissioned.

5.0 PLANT SITE CONSIDERATIONS

5.1 Sea Level

The City of Charlottetown has set 5.45 metres CD⁸ as the minimum elevation for waterfront properties in response to its sea level rise projections. The majority of the Plant Site is below this level. While the Plant Site is not zoned as waterfront property, the Company believes that it is prudent that future infrastructure be designed to meet or exceed the city's guidelines for waterfront properties. For example, the elevation of the proposed location of the CT3 Equipment Building will be raised, and fill currently at the Plant Site could be used for this purpose with any incremental fill required being imported from off-site.

5.2 Installation of CT4

Installation of additional generation (i.e., CT4) at the Plant Site will require a substantial area for equipment laydown⁹ to enable an efficient installation schedule. Once installation is complete, the area used for equipment laydown can be used for other system infrastructure. In addition, a buffer area around generation and other infrastructure is required to allow for operating and maintenance activities.

Earlier plans were to use the land currently leased to Holland College as the equipment laydown area. This presumed the installation of CT4 would occur prior to the CTGS decommissioning, meaning the Steam Plant Building was still on-site and operational. Decommissioning and removal of the Steam Plant Building prior to the installation of CT4 allows for a different, and more efficient, use of the site's land areas. The proposed laydown area during the installation of CT4 is illustrated in Figures 3 and 4.

5.3 Expansion

A number of trends will continue to impact the electric utility industry, including increased use of electrified space heating, the pace of adoption of electrified transportation, and incorporation of intermittent renewables in the energy supply mix. In addition, future

⁸ CD refers to chart datum, which is a typical water level measurement unit that displays depths on a nautical chart. It is generally derived from tidal phases.

⁹ A laydown area is an area used for the receipt, temporary storage, and sometime for the assembly of construction equipment and other supplies.

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advances in energy storage technology could produce compact technologies suitable for urban environments.

The Plant Site has sufficient space that would allow for energy storage infrastructure and renewable energy options to be located near the most densely populated area on the Island. The land leased¹⁰ to and used by Holland College as a parking lot currently serves as a buffer between the generating operations at the Plant Site and area residents and businesses. Furthermore, the land leased to Holland College provides Maritime Electric with the long-term flexibility to use that land to incorporate energy storage infrastructure into the system close to its highest density of load should the technology become economical.

5.4 Infrastructure Replacement

The Charlottetown 69 kV substation is in fair condition but it is nearing 60 years old. Maritime Electric expects that this substation will need to be replaced by 2030 due to structural aging. The configuration of this substation does not allow it to remain partially operational while being replaced. Instead, a new substation must be constructed and the existing substation removed, and the Plant Site has adequate space to accommodate the new replacement substation, as illustrated in Figure 5.

The five million litre bunker C fuel oil tank, which was constructed in 1945, will be removed as part of the CTGS decommissioning. A diesel fuel tank will be required when CT4 is installed and can be placed within the existing fuel containment system, so no additional land is required for the new tank.

6.0 PLANT SITE PLAN

Maritime Electric will continue using the entire Plant Site as a transmission hub, distribution centre, and generating facility for decades to come. Its strategic location close to key Charlottetown, Stratford and critical Island facilities¹¹ highlights its importance to

¹⁰ Leased under a year-to-year agreement.

¹¹ Such as the Queen Elizabeth Hospital, Hillsborough Hospital, fuel depot, Charlottetown Waste Water Treatment Plant, and other facilities located along the Hillsborough River.

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the Company's energy delivery system. Over the next fifteen years a number of changes to the Plant Site will be necessary but will occur in stages, as summarized below.

6.1 2021 Site Plan (Existing)

The Plant Site currently contains (refer to Figure 1):

1. the Steam Plant Building that houses the thermal generation units CTGS #9 and CTGS #10, which are currently in long-term layup with planned decommissioning to begin in 2022;
2. the ECC building;
3. CT3 and associated step up transformer (X4);
4. fuel storage consisting of a two million litre CT3 diesel storage tank, a five million litre CTGS bunker C fuel oil tank, and containment infrastructure and associated fuel offloading facility;
5. the Charlottetown 69 kV substation and associated substation control building;
6. 20 MVar of 69 kV-connected capacitors (69 kV capacitor bank);
7. the machine shop, which houses equipment used to help maintain generating and other Company facilities;
8. a storage building on the corner of Cumberland and Richmond Streets;
9. a parking lot currently under year-to-year lease to Holland College; and
10. land used as a transmission and distribution line corridor.

Many of the existing facilities will remain in place during the next fifteen years:

- the ECC building (#2 above) will remain;
- CT3 and its associated step up transformer (#3 above) will remain, providing reliable backup and emergency supply for at least the next 35 years;
- the existing fuel storage, containment and offloading facility (#4 above) will remain to support CT3, as well as a future CT4, with the exception of the five million litre CTGS bunker C fuel oil tank which will be removed as discussed in the 2023 Site Plan below;

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- the substation control building (included in #5 above) will remain, continuing to provide control functions for the substation; however, the 69 kV substation will be replaced with a new 69 kV substation as discussed in the 2030 Site Plan;
- the recently installed 69 kV capacitor bank (#6 above) will remain, continuing to provide voltage support to central and eastern PEI;
- the machine shop (#7 above) will remain, continuing to provide mechanical services for the Plant Site as well as other Company facilities;
- the storage building (#8 above) will remain;
- the parking lot currently leased to Holland College (#9 above) will remain for the short- to medium-term; and
- land used as a transmission and distribution line corridor (#10 above) will remain.

6.2 2022 Site Plan

As detailed in the 2021 Supplemental Capital Budget Request Application for the construction of a CT3 Equipment Building, a new building is required to house the CT3 equipment, which must be removed from the existing Steam Plant Building prior to its demolition.

Figure 2 shows the proposed location of the new CT3 Equipment Building.

6.3 2023 Site Plan

As discussed, CTGS #9 and CTGS #10 are currently in long-term layup with decommissioning scheduled to begin in 2022. Decommissioning includes the demolition of the Steam Plant Building and associated stacks, the River Pumphouse¹², some of the underground cooling water pipes that currently connect the CTGS to the River Pumphouse, and the five million litre CTGS bunker C fuel oil tank.

Figure 3 shows the Plant Site after the decommissioning and removal of the Steam Plant Building and the bunker C fuel oil tank. Figure 3 also shows the placement of new trees and landscaping to beautify the area.

¹² The River Pumphouse is not shown in Figures 1 to 6 attached because it is located on the other side of Water Street.

6.4 2025 Site Plan

The 2020 Integrated System Plan indicated that new on-Island dispatchable generating capacity will be required by 2024. Maritime Electric recommends that a new combustion turbine, CT4, be installed to replace the capacity lost with the closure of CTGS.

Maritime Electric recommends that CT4 be located at the Plant Site, where the older portion of the Steam Plant Building was located prior to its demolition, as illustrated in Figure 4. The placement of CT4 to the southeast of the existing machine shop will enable ample area around the unit for both installation and future maintenance activities. The required step up transformer ("X5") would be located close to CT4 in a configuration similar to CT3. The planned placement of CT4 and X5 will allow sufficient space for the 69 kV substation replacement, which is planned in the 2030 timeframe.

Installation of a combustion turbine requires a significant area for equipment laydown. The Company intends to use the area along Cumberland Street, which currently houses the thermal generating units CTGS #9 and CTGS #10 for this purpose. Demolition of the Steam Plant Building prior to the installation of CT4 creates sufficient space required for equipment laydown and close to the proposed CT4 location to facilitate an efficient installation schedule.

Similar to CT3, CT4 will require supporting equipment to be installed on site. The planned CT3 Equipment Building, scheduled to be constructed in 2021/2022 subject to Commission approval, will need to be expanded in 2024/2025 to house the equipment needed for CT4. There is sufficient space around the proposed equipment building to allow for this expansion.

A new diesel fuel storage tank for CT4 will be installed within the existing fuel containment facility. Consistent with the capacity of the CT3 fuel tank, the CT4 fuel tank will hold seven days of fuel. Two diesel fuel tanks will allow the Company to take one tank out of service for inspection and maintenance, and still store sufficient fuel in one tank to supply both generators for three days of generation.

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Figure 4 also illustrates a new heavy truck access road in the most southerly corner of the site property from Water Street, minimizing or eliminating the amount of construction traffic on Cumberland and Richmond Streets.

6.5 2030 Site Plan

The existing Charlottetown 69 kV substation is expected to reach its end of life and require replacement by 2030. Maritime Electric intends to construct a new 69 kV substation at the Plant Site, as illustrated in Figure 5. The existing Charlottetown substation will be decommissioned and removed only after the new substation has been energized and commissioned.

Energy storage infrastructure may approach economic viability by the end of 2030 if prices continue to decline, or if a transformative change in technology occurs. The Plant Site is an ideal location for small- to medium-scale energy storage as it is an existing industrial site located close to a load centre, and release of energy from the energy storage at peak times will reduce transmission system loading. Energy storage devices could be located in the area that was used for the CT4 equipment laydown area. The low profile and generally small footprint of energy storage devices would provide a visual buffer between Cumberland Street residents and the Plant Site generation facilities.

6.6 2035 Site Plan

Significant uptake of electrified transportation will lead to large increases in Island energy and load requirement.

A 138 kV substation may eventually be required in downtown Charlottetown to provide reliable service as well as offload the 69 kV transmission assets¹³. In addition, a 138 kV substation would provide another path for the energy from CT3 and CT4 to be distributed to customers outside of the downtown Charlottetown area. The 138 kV substation would

¹³ With continued load growth and no system upgrades, the two 69 kV transmission lines running between the West Royalty and Charlottetown substations will eventually reach their capacity. The implication of this is that should one of these transmission lines be out of service, the remaining transmission line would have insufficient capacity to carry the load of both lines. This would result in a thermal overloading situation and wide-spread outages.

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be located where the 69 kV substation is currently located, as illustrated in Figure 6, and would be constructed in a staged approach similar to the Lorne Valley site¹⁴.

Additional energy storage, if required, will be located adjacent to the energy storage discussed in the 2030 Site Plan section. It would provide an additional visual buffer between the Cumberland Street residents and the Plant Site generating equipment.

Figure 6 also illustrates a re-aligned fuel tanker truck offloading road.

6.7 Landscaping

The visual impact of the Plant Site will be a consideration going forward, especially along Cumberland Street and Water Street Parkway. The Company will install vegetation and earthen berms as needed throughout the timeline to help minimize the visual impact of the equipment contained on the site.

7.0 CONCLUSION

The Plant Site is, and will continue to be, a key location in the Company's long-term plan. A strong, reliable energy source is required at the Plant Site to accommodate the area's continued electrification of space heating and the growth of electrified transportation.

The Plant Site will serve as a transmission hub, distribution centre, and generating station for decades to come. Its location close to key Charlottetown, Stratford and Island facilities highlights its importance to the Company's energy delivery system. The Plant Site's strategic location is valuable for its current usage, and offers long-term flexibility for the Company to address load growth, replace aging infrastructure and to incorporate future energy technologies.

Over the next fifteen years a number of changes to the Plant Site will be necessary, including demolition and removal of the Steam Plant Building and related facilities, the

¹⁴ At the Lorne Valley site, a new 69 kV substation was constructed to replace an existing 69 kV substation. Long-term substation plans include a new 138 kV substation located on the site of the old 69 kV substation.

Charlottetown Plant Site Long-Term Plan

addition of a second combustion turbine, the replacement of the existing 69 kV substation, the installation of energy storage infrastructure, and the addition of a 138 kV substation.

Maritime Electric expects the following facilities will be located at the Plant Site by 2035.

Existing facilities:

- ECC building;
- CT3 and associated step up transformer;
- fuel storage, containment and offloading facility;
- 69 kV substation and substation control building;
- 69 kV capacitor bank;
- machine shop; and
- storage building.

Additional facilities:

- new CT3 and CT4 Equipment Building;
- CT4, associated step up transformer, and fuel storage tank;
- energy storage infrastructure; and
- 138 kV substation.

The proposed site changes and additions will enable the Plant Site to effectively and reliably provide serve to customers for decades to come.

Figure 1 – Existing Site Layout 2021

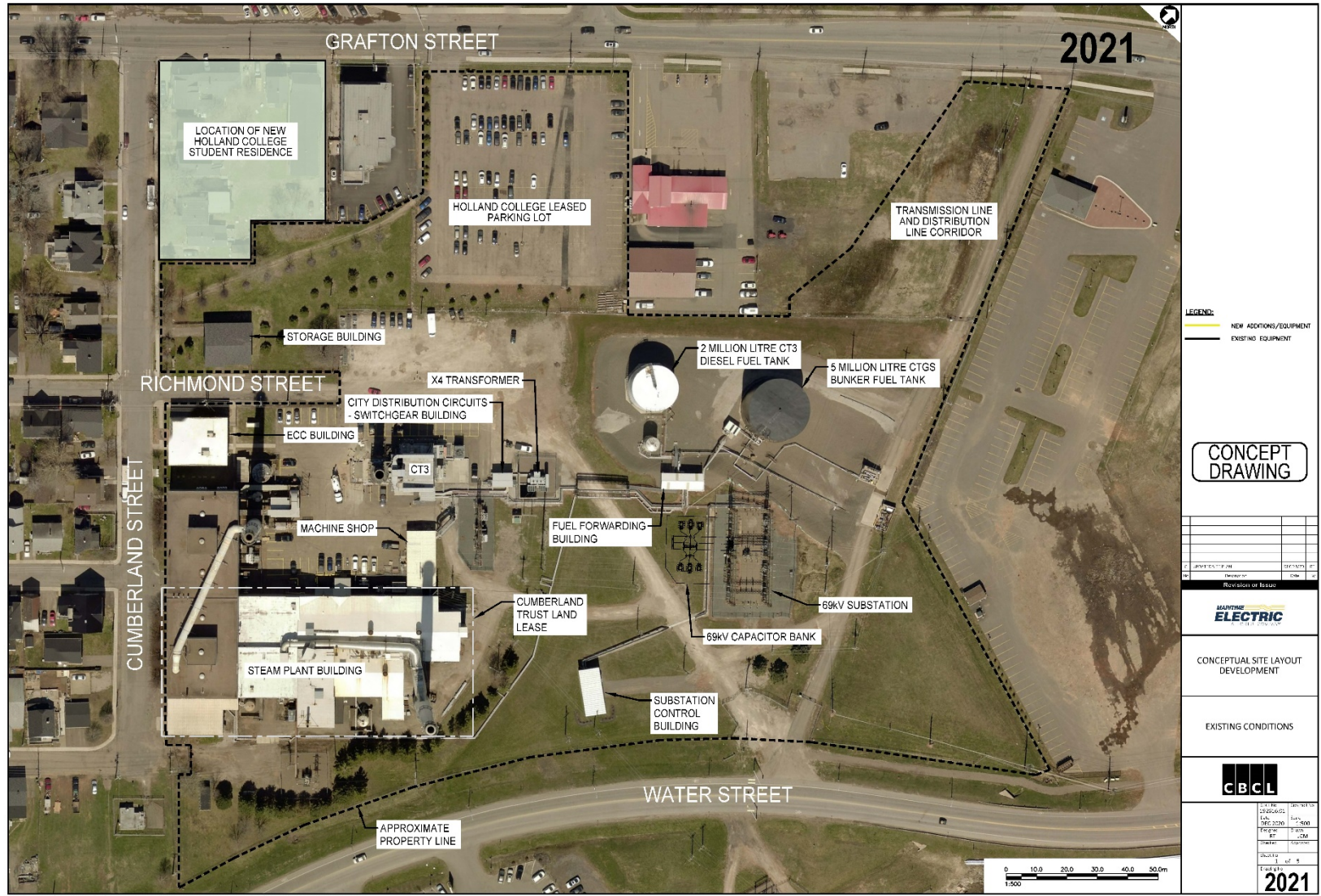


Figure 2 – Conceptual Site Layout 2022



Figure 3 – Conceptual Site Layout 2023

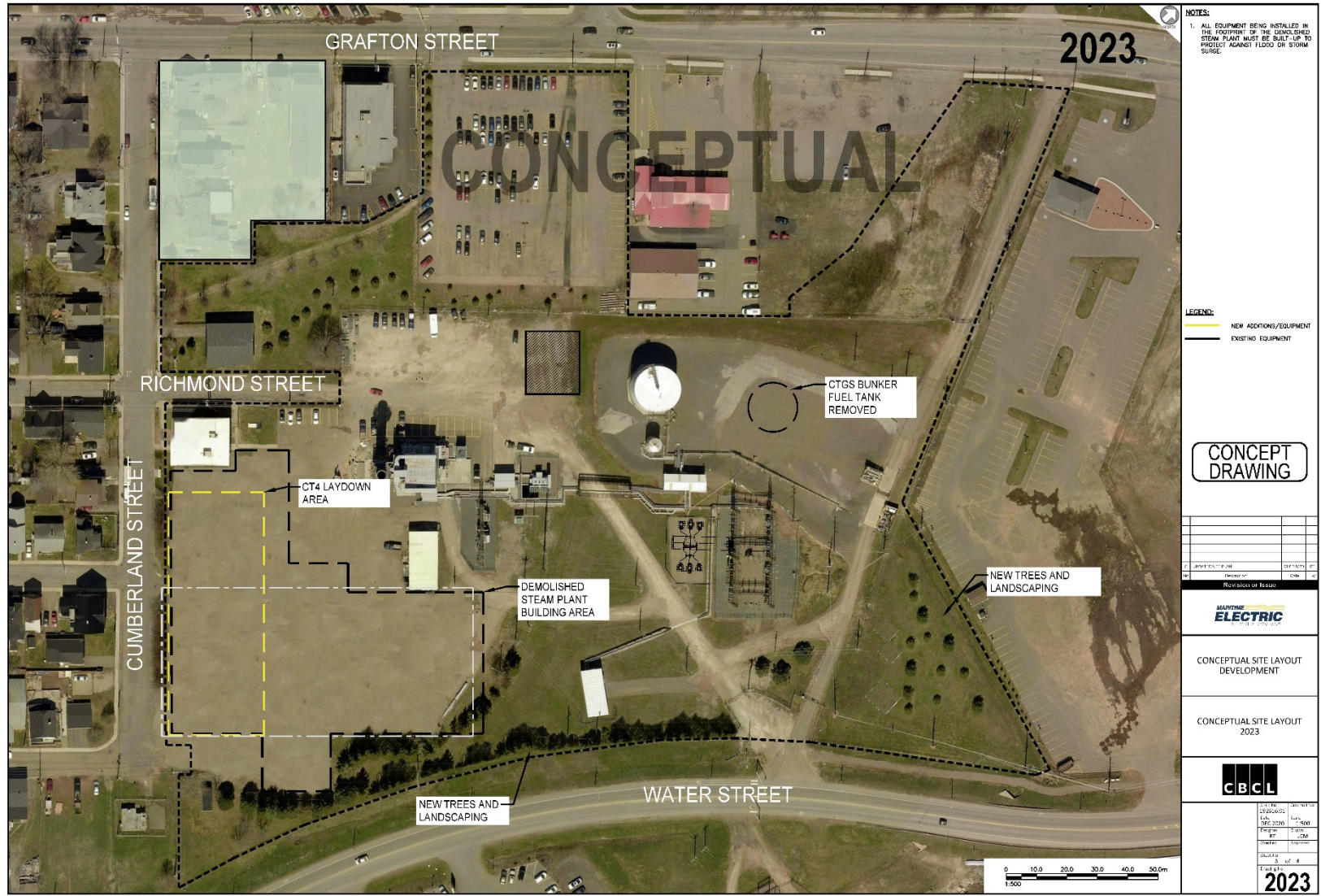


Figure 4 – Conceptual Site Layout 2025

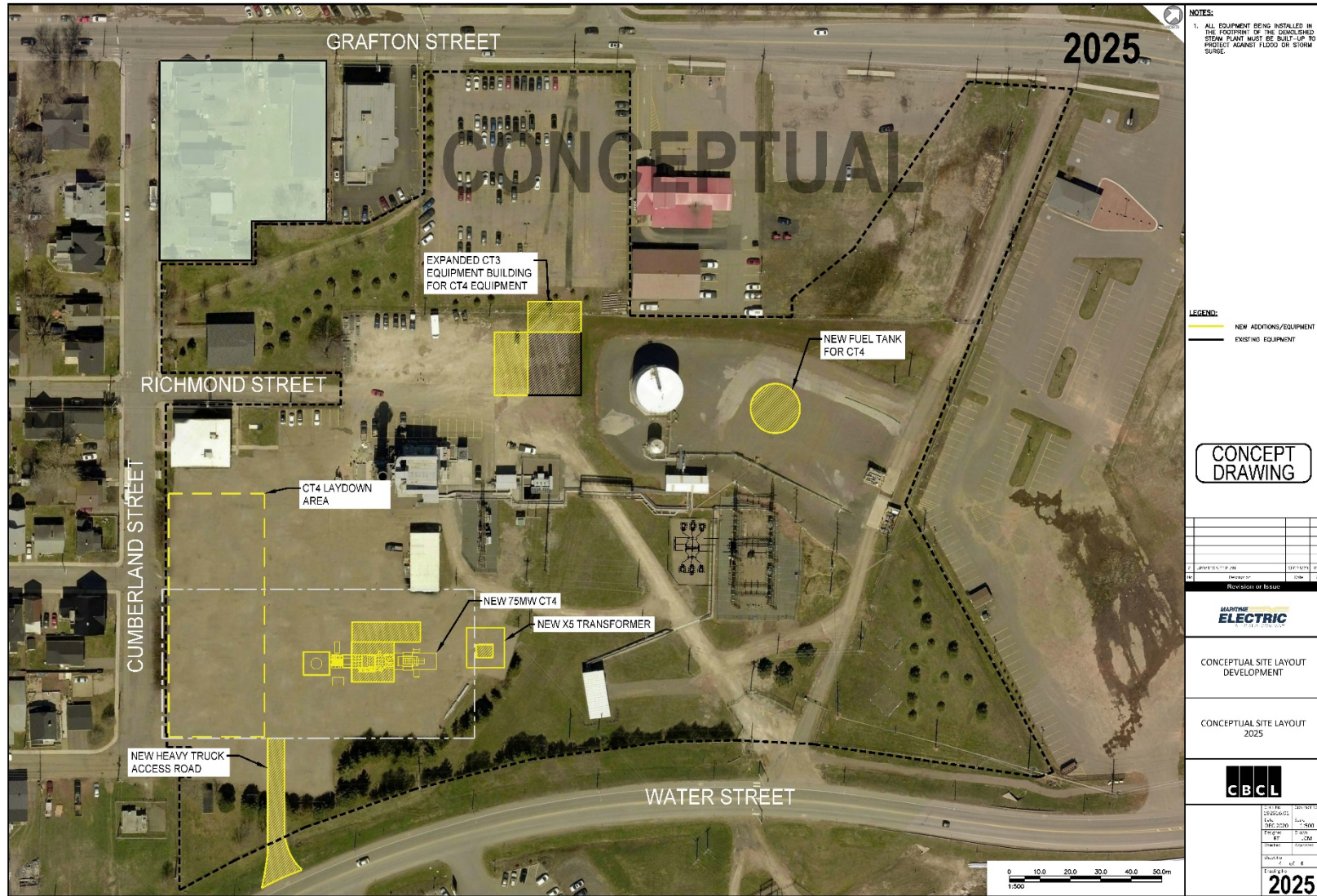


Figure 5 – Conceptual Site Layout 2030

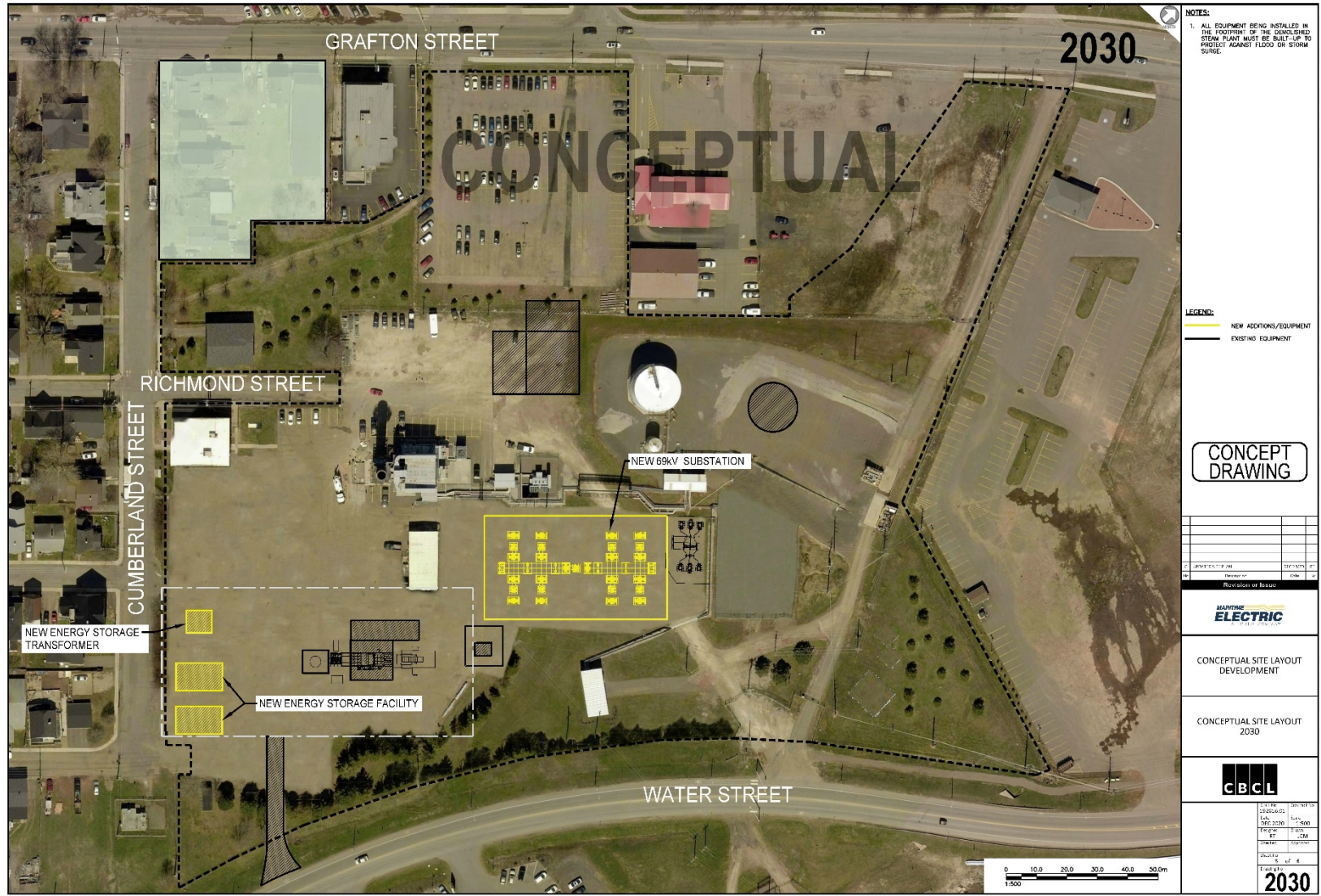
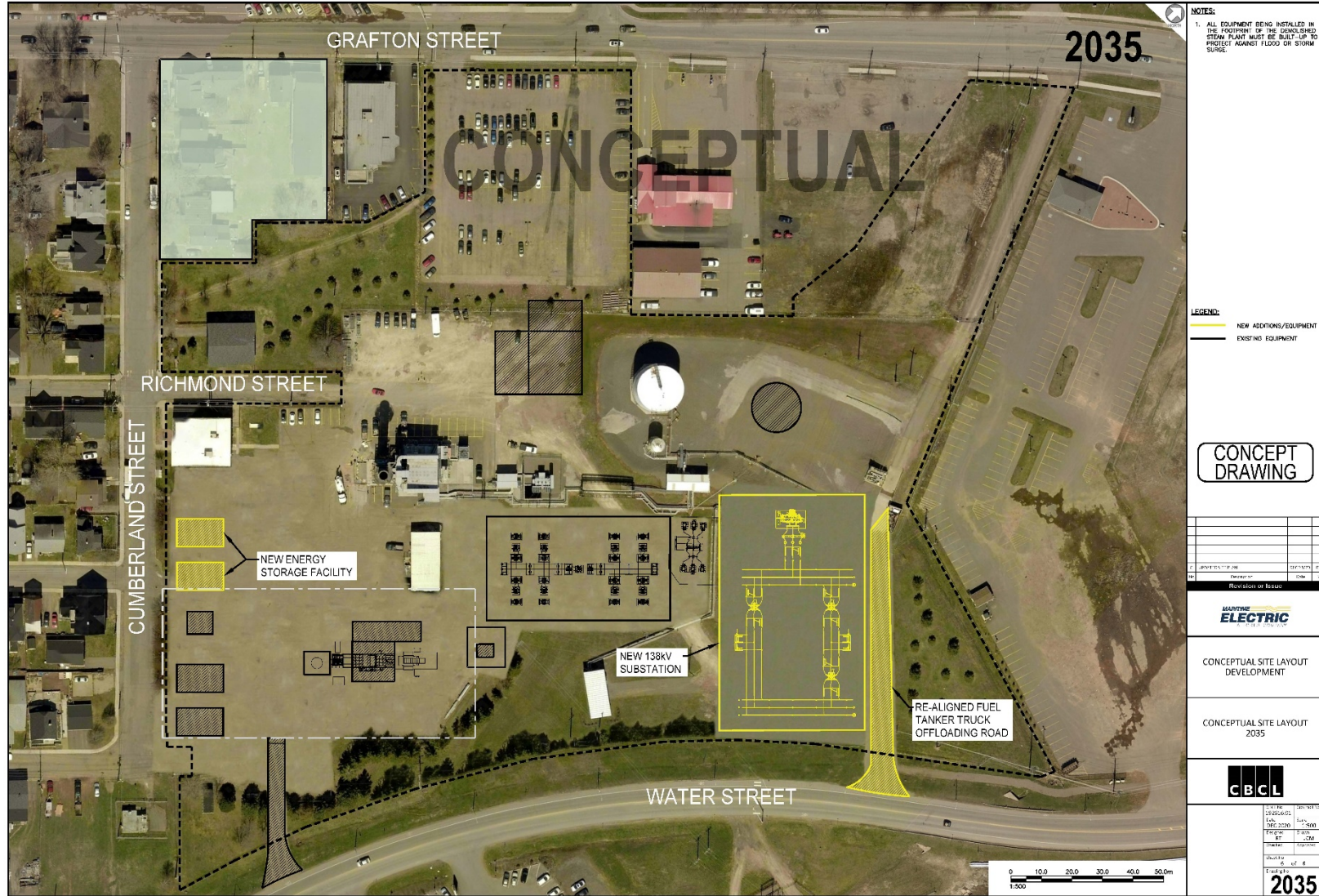


Figure 6 – Conceptual Site Layout 2035



APPENDIX B

Original Cost Estimate, May 31, 2019



CBCL LIMITED

Consulting Engineers

May 31, 2019

Mr. Kent Nicholson
Manager, Production and Energy Control Operations
Maritime Electric Company Limited
180 Kent Street, P.O. Box 1328
Charlottetown, PE C1A 7N2

RE: *MECL Turbine Balance of Plant Building Probable Cost – Revised*

Dear Mr. Nicholson

1. SCOPE OF WORK

MECL requested CBCL provide an AACE Class 1 estimate for the design of revised building design to house the relocated services for the CT3 combustion turbine only at the site. The revised design does not include any machine shop, office, or any support or storage space other than that required to support the turbine. CBCL modified the original design drawings to a stage to allow the completion of this probable cost. The drawings require additional work to be advanced to a tender stage package.

2. PROBABLE COST DEVELOPMENT

This opinion of probable costs is presented on the basis of experience, qualifications, and best judgement. It has been prepared in accordance with acceptable principles and practices. Market trend changes; non-competitive bidding situations; unforeseen labour and material adjustments, availability and the like are beyond the control of CBCL Limited and as such cannot warrant or guarantee that actual costs will not vary from the opinion provided.

There are a number of assumptions associated with the probable cost presented. A list of the most significant assumptions are below:

1. Based on discussions with MECL and local companies, labour rates for electrical and mechanical trades persons are not expected to exceed \$70/hr including overhead and profit.
2. A productivity factor for the electrical and mechanical trades is assumed to be 85% as this project is expected to be complex and may require extended or overtime hours to complete. Extended and overtime hours and complex work typically result in reduced productivity of workers.
3. A congestion factor of 1.15 is carried for the mechanical labour carried out inside the new building due to the timetable and space available to complete the work. This is a factor that is identified in the RS MEANS estimating guide.
4. The underground HV cable ducts in the area of the new building can be de-energized during construction and it is assumed the required piles can be installed

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**Solving
today's
problems
with
tomorrow
in mind**





CBCL LIMITED

Consulting Engineers

Mr. Kent Nicholson

May 31, 2019

Page 2 of 4

with minimum interference to these underground ducts. Relocation of ducts is not included in the scope of work. MECL to co-ordinate any work required to de-energize these circuits.

5. General Requirements and Contractor fees of 15% have been included in the probable cost. These costs are not included in the other components of the probable cost.
6. The project is envisioned as a single contract under a general contractor with the building constructed prior to any equipment being relocated.
7. New cables are provided for the feeder to the MECL supplied transformer and from the relocated switchgear to the new Motor Control Center as the existing cables are either too short or do not meet present code requirements.
8. The existing Motor Control Centre and DC charger will be reused and it is anticipated this may result in a slightly longer outage time. A new MCC was identified as a cost item in the AACE Class 4 estimate.
9. Cables to the existing tank farm are of adequate length to connect to new equipment location and their re-use has been included in the probable cost.
10. No communications equipment other than a network switch is provided and MECL will supply and install the required incoming fibre and transducers for networking.
11. MECL will supply a standard 1500kVA Delta Wye transformer which will be on a pad with blast walls. An option of the supply of a Wye-Wye transformer with fusing will be examined for cost savings in the remaining design.
12. MECL will provide fuel to fill the generator tank
13. All existing electrical and mechanical equipment being relocated is functional
14. The existing cable tray between the tank farm and the existing turbine is adequate for the new cables to be installed and new piping shall be installed adjacent to the existing tray with new supports as required.
15. New transformers and distribution for the new building will be provided under the contract.
16. No contractor costs are carried to refeed any existing loads not associated with the BOP equipment that remain in the existing location. MECL will carry any costs to re-instate lighting and power in the existing building.



CBCL LIMITED

Consulting Engineers

Mr. Kent Nicholson

May 31, 2019

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17. No costs are carried for the demolition of the existing generators or any other equipment or cabling not being relocated
18. No costs are carried for any new BOP instrumentation not presently installed.
19. Costs are based on the existing as-builts provided by MECL and field investigation
20. No costs are carried for the demolition of any mechanical equipment or piping not being relocated
21. No costs are being carried to drain the mechanical system prior to equipment relocation. The system will be handed over to the contractor in the drained state.
22. The air system being relocated does not supply any other equipment in the existing building other than the BOP equipment. No allowance has been made for any air required in the existing building after the compressors have been relocated.
23. Heat traced PVC piping is used for water line from new building to tie point for piping back to storage tank for boiler system. Transfer to this tank is done manually.
24. As discussed with MECL, the air line is not to be insulated or heat traced as the air system includes a dryer.
25. Temporary power to the CT3 skid will be provided by MECL
26. Owner costs are as provided by MECL.
27. The general sequence for the project is to have the building constructed first with the new storage tank installed inside. All mechanical and electrical building services and services for the balance of plant equipment will be installed to the extent possible without a new utility service available. Once the building is mainly complete, a planned six (6) week shutdown would occur to enable the relocation of all equipment from the existing to new building. This schedule will be provided to the contractor and they will need to determine required staffing to meet the schedule.



CBCL LIMITED

Consulting Engineers

Mr. Kent Nicholson

May 31, 2019

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The probable cost information provided includes the following;

1. Cost Comparison of CBCL probable cost to AACE Class 4 cost (2 pages)
2. Summary sheet of probable cost (1 page)
3. Elemental summary of probable cost (2 pages)
4. Elemental WBS backup of probable cost excluding mechanical (13 pages)
5. Elemental backup of mechanical costs (9 pages)

Please review the attached probable cost information and if you have any questions please contact us.

Yours truly,

Prepared by:
Randy Thorpe, P.Eng. PMP
Senior Project Manager

Direct: 902-492-7971

E-Mail: randyt@cbcl.ca

Project No: 192616.00

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OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation

AACE Class 1 vs. Class 4 Cost Comparison

DATE:	May 30, 2019
CBCL No:	192616.00
PREPARED BY:	GA/PS/MP/KP/AT
BUDGET:	AACE Class 1

No.	DESCRIPTION	Class 1 Budget Amount	AACE Class 4 Budget Amount	Difference %	Difference \$	Notes on Difference
A	BUILDING SHELL	\$716,000.00	\$637,000.00	12%	(\$79,000.00)	Piles, grade beams and reinforced slab were not included in AACE Class 4 budget (approx \$300k difference) but required due to site conditions. Steel structure costs appear to be approx \$100k lower in AACE Class 4 estimate than CBCL estimate. Reduction in building size has offset most of these additional costs.
B	INTERIORS	\$130,000.00	\$218,000.00	-40%	\$88,000.00	Interiors are significantly less due to decreased building size
C1	MECHANICAL - BUILDING	\$84,000.00	\$200,300.00	-58%	\$116,300.00	Mechanical services are significantly less due to decreased building size
C1A	MECHANICAL - PROCESS	\$562,000.00	\$295,100.00	90%	(\$266,900.00)	Mechanical costs for RO-EDI system relocations seem not to fully account for stainless steel piping (\$25k) and necessary pickling and flushing (\$50k). Water line back to boiler not included (\$20k) Oil/water separator price very low at \$10k vs \$55k required (\$45k). No piping support pricing seems to be included (\$80k) Air system relocation seems low (\$40k). 4 week, 4 men allowance for relocating RO-EDI thought to be low (\$30k)
C2	ELECTRICAL c/w INSTRUMENTATION & CONTROLS	\$871,000.00	\$880,800.00	-1%	\$9,800.00	Heat Trace (\$45k) not apparent in AACE Class 4 estimate. Relocation of RTU's, and Waste water control panels not evident in estimate (\$20k). Instrument relocation and electrical system commissioning not evident in estimate (\$30k). These costs offset by re-use of existing MCC and DC charger
D1	SITEWORK	\$348,000.00	\$218,000.00	60%	(\$130,000.00)	Pipe trench (\$50k) not evident in sitework or piping estimate. Transformer pad (\$10k) not evident. Relocation of existing UG lines as required for building not apparent in estimate (\$50k). Paving cost seems low compared to area required to be paved (\$35k)
D2	ANCILLARY WORK - EQUIPMENT RELOCATIONS	\$29,464.50	included in C1A			These costs could not be isolated from other costs in AACE Class 4 estimate.
Z1	GENERAL REQUIREMENTS AND CONTRACTORS FEE	\$411,000.00	\$96,500.00	326%	(\$314,500.00)	Original AACE Class 4 estimate of general contractor fees very low for construction amount presented (less than 4% of construction cost not 15% as common in industry). (additional \$250k) As capital costs increase contractor fees increase proportionally. (\$60k)
Z24	DESIGN DEVELOPMENT CONTINGENCY - Note 1	\$0.00	Not Included			Original AACE Class 4 estimate did not include cost for any design development. It would not be unusual to carry a 25% design development contingency in a Class 4 estimate (\$615k).
	ESCALATION (Based on 2019 Can. Dollars)	Not Included	Not Included			
	TOTAL CONSTRUCTION AMOUNT without Contingency, Design Fees or Owner Costs	\$ 3,151,000.00	\$ 2,545,700.00	24%	\$ (605,300.00)	



OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation

AACE Class 1 vs. Class 4 Cost Comparison

DATE:	May 30, 2019
CBCL No:	192616.00
PREPARED BY:	GA/PS/MP/KP/AT
BUDGET:	AACE Class 1

No.	DESCRIPTION	Class 1 Budget Amount	AACE Class 4 Budget Amount	Difference %	Difference \$	Notes on Difference
Z23	CONSTRUCTION CONTINGENCY - C.O.'s	\$315,000.00	\$255,049.00	24%	(\$59,951.00)	Construction contingency a factor of capital cost and generally AACE Class 4 and CBCL each carried 10%
Z21	DESIGN FEES & DISBURSEMENTS	\$753,000.00	\$553,888.00	36%	(\$199,112.00)	Engineering fees higher (\$45k) than AACE Class 4 estimate 10% added to engineering fees in CBCL bid for contingency (\$20k)
	TEMPORARY SWING SPACE	Not Applicable	Not Applicable			
	MOVING ALLOWANCE	Not Applicable	Not Applicable			
	TOTAL CONSTRUCTION AMOUNT with Contingency, Design Fees and Owner Costs	\$ 4,219,000.00	\$ 3,355,000.00	26%	\$ (864,000.00)	

General Note : The structure and breakdown of the Class 4 AACE Estimate provided differs from the requested AACE Class 1 estimate format and was based on a different building design. The Class 4 AACE Estimate have been assigned to match the equivalent AACE categories to the based on the description in each estimate category. However, there may be costs included in general description of items in the Class 4 AACE Estimate that are not evident and are indicated as not included in notes detailing differences. The original estimate was AACE Class 4 which has an expected accuracy of -30% to +50% (\$2.35M -\$5.03M for the \$3.355M estimate) This was without taking into account the site conditions (poor soil conditions) requiring additional costs . The CBCL Class 1 probable cost range for the smaller building design is -10% to +15% (\$3.81M to \$4.86M for \$4.23M) However, this opinion of probable costs is presented on the basis of experience, qualifications, and best judgement. It has been prepared in accordance with acceptable principles and practices. Market trend changes; non competitive bidding situations; unforeseen labour and material adjustments, availability and the like are beyond the control of CBCL Limited and as such cannot warrant or guarantee that actual costs will not vary from the opinion provided.



OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation
Class 1 - Elemental Format Construction & Design Budget
 (Based on Reduced Scope Requirements dated May-2019)

DATE:	May 30, 2019
CBCL No:	192616.00
PREPARED BY:	GA/PS/MP/KP/AT
BUDGET:	Class 1

No.	DESCRIPTION	GFA m ²	Cost / m ²	Budget Amount	% of Total
A	BUILDING SHELL	331	\$2,163	\$716,000	17%
B	INTERIORS	331	\$393	\$130,000	3%
C1	MECHANICAL - BUILDING	331	\$254	\$84,000	2%
C1A	MECHANICAL - PROCESS	331	\$1,698	\$562,000	13%
C2	ELECTRICAL c/w INSTRUMENTATION & CONTROLS	331	\$2,632	\$871,000	21%
D1	SITWORK	331	\$1,051	\$348,000	8%
D2	ANCILLARY WORK - EQUIPMENT RELOCATIONS	331	\$89	\$29,465	1%
Z1	GENERAL REQUIREMENTS AND CONTRACTORS FEES	331	\$1,242	\$411,000	10%
Z24	DESIGN DEVELOPMENT CONTINGENCY - Note 1	331	\$0	\$0	0%
	ESCALATION (Based on 2019 Can. Dollars)	331	\$0.00	Not Included	0%
TOTAL CONSTRUCTION AMOUNT without Contingency, Design Fees or Owner Costs		331	\$9,521	\$3,151,000	74.7%
Z23	CONSTRUCTION CONTINGENCY - C.O.'s - Note 2	331	\$952	\$315,000	7.5%
Z21	DESIGN FEES & DISBURSEMENTS	331	\$2,275	\$753,000	17.8%
	TEMPORARY SWING SPACE	331	\$0	Not Applicable	0.0%
	MOVING ALLOWANCE	331	\$0	Not Applicable	0.0%
TOTAL CONSTRUCTION AMOUNT with Contingency, Design Fees and Owner Costs		331	\$12,748	\$4,219,000	100%

This opinion of probable costs is presented on the basis of experience, qualifications, and best judgement. It has been prepared in accordance with acceptable principles and practices. Market trend changes; non competitive bidding situations; unforeseen labour and material adjustments, availability and the like are beyond the control of CBCL Limited and as such cannot warrant or guarantee that actual costs will not vary from the opinion provided.

- Note 1** A Design Development Construction Contingency is to allow for necessary, increase in scope costs as the work is better defined
Note 2 A Construction Contingency is for the cost of additional work over and above the original tendered contract amount
Note 3 The Escalation/Inflation is for anticipated increases in construction costs from time of budget & tender call - (Not Included based on 2019 Dollars)

Form Uniformat Elemental



OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation
Class 1 - Elemental Summary

DATE:	May 30, 2019
CBCL No:	192616.00
PREPARED BY:	DC/PS/LP/MP/AT
BUDGET:	Class 1

ELEMENT	GFA 331 m2	Ratio to GFA	Elemental Amount		Rate per Area		%
			Sub-total	Total	Sub-total	Total	
A SHELL				\$ 716,000		\$ 2,163	17.0%
A1 SUBSTRUCTURE				239,411		723	5.7%
A11 Foundations		1.000	\$	239,411		723.38	5.7%
A12 Basement Excavation		0.003	\$	-		0.00	0.0%
A2 STRUCTURE				168,204		508	4.0%
A21 Lowest Floor Construction		1.000	\$	35,532		107.36	0.8%
A22 Upper Floor Construction		0.003	\$	-		0.00	0.0%
A23 Roof Construction		1.000	\$	132,672		400.87	3.1%
A3 EXTERIOR ENCLOSURE				307,868		930	7.3%
A31 Walls Below Grade		0.000		Not Applicable		0.00	
A32 Walls Above Grade		1.000	\$	241,928		730.99	5.7%
A33 Windows and Entrances		1.000	\$	1,030		3.11	0.0%
A34 Roof Coverings		1.003	\$	64,910		196.13	1.5%
A35 Projections		0.000		Not Applicable		0.00	
B INTERIORS				\$ 130,000		\$ 393	3.1%
B1 PARTITIONS AND DOORS				56,789		171.59	1.3%
B11 Partitions		1.310	\$	37,607		113.63	0.9%
B12 Doors		1.000	\$	19,182		57.96	0.5%
B2 INTERIOR FINISHES				36,129		109.16	0.9%
B21 Floor Finishes		1.000	\$	26,157		79.04	0.6%
B22 Ceiling Finishes		0.038	\$	966		2.92	0.0%
B23 Wall Finishes		2.620	\$	9,005		27.21	0.2%
B3 FITTINGS AND EQUIPMENT				37,025		111.87	0.9%
B31 Fittings and Fixtures		1.000	\$	37,025		111.87	0.9%
B32 Equipment		1.000	\$	-		0.00	0.0%
B33 Conveying Systems		1.000	\$	-		0.00	0.0%
C SERVICES				\$ 1,517,000		\$ 4,584	36.0%
C1 MECHANICAL - BUILDING				84,000		253.81	2.0%
C11 Plumbing and Drainage		1.000	\$	24,700		74.63	0.6%
C12 Fire Protection		1.000	\$	30,088		90.91	0.7%
C13 HVAC		1.000	\$	28,250		85.36	0.7%
C1A MECHANICAL - PROCESS				562,000		1698.09	13.3%
C15 Water Treatment (Inside)			\$	312,235.29			
C16 Water Treatment (Outside)			\$	95,000.00			
C16 Compressed Air			\$	41,000.00			
C18 Water Treatment System Removal			\$	60,000.00			
C18 Oil Water Separator			\$	45,764.71			
C19 Compressed Air System Removal			\$	8,000.00			
C2 ELECTRICAL c/w INSTRUMENTATION & CONTROLS				871,000		2631.74	20.6%
C21 Electrical Disconnects & Demolition		1.000	\$	21,084		63.71	0.5%
C22 Relocate Existing Equipment		1.000	\$	10,212		30.85	0.2%
C23 Systems and Ancillaries		1.000	\$	705,402		2131.38	16.7%
C19 Instrumentation and Controls			\$	133,695		403.96	3.2%
NET BUILDING SUBTOTAL - LESS SITE				2,362,425		\$ 7,138	56.0%



OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation
Class 1 - Elemental Summary

DATE:	May 30, 2019
CBCL No:	192616.00
PREPARED BY:	DC/PS/LP/MP/AT
BUDGET:	Class 1

ELEMENT	GFA 331 m2	Ratio to GFA	Elemental Amount		Rate per Area		%
			Sub-total	Total	Sub-total	Total	
A SHELL				\$ 716,000		\$ 2,163	17.0%
D SITE & ANCILLARY WORK				\$ 378,000		\$ 1,142	9.0%
D1 SITWORK				348,000		1051.49	8.2%
D11 Site Development		1.000	\$	131,855		398.40	3.1%
D12 Mechanical Site Services		1.000	\$	94,544		285.67	2.2%
D13 Electrical Site Services		1.000	\$	120,841		365.12	2.9%
D2 ANCILLARY WORK - EQUIPMENT RELOCATIONS				30,000		90.65	0.7%
D21 Equipment Relocations		1.000	\$	29,465		89.03	0.7%
D22 Alterations		0.003		Not Applicable			
NET BUILDING SUBTOTAL - INCLUDING SITE				2,740,425		\$ 8,280	65.0%
Z GENERAL REQUIREMENTS AND ALLOWANCES				\$ 1,479,000		\$ 4,469	35.1%
Z1 GENERAL REQUIREMENTS AND CONTRACTORS FEES				411,000		1241.84	9.7%
Z11 General Requirements and Overheads		1.000	\$	136,878		413.58	3.2%
Z12 Contractors Profit		1.000	\$	273,756		827.16	6.5%
Z2 ALLOWANCES				1,068,000		3226.98	25.3%
Z21 Design Fees and Disbursements		1.000	\$	753,000		2275.20	17.8%
Z22 Escalation Allowance		1.000		Not Included		0.00	
Z23 CONSTRUCTION CONTINGENCY - C.O.'s - Note 2			\$	315,000			7.5%
Z24 Design Development Construction Contingenc		1.000	\$	-		0.00	0.0%
TOTAL CONSTRUCTION COST (Less HST)				\$ 4,219,000		\$ 12,748	100.0%



**OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation**

**Estimate Backup
WBS Element**

Gound Floor Area SM	331	DATE:	May 30, 2019
2nd Floor Area SM	0	CBCL No:	192616.00
Total Bldg Area SM	331	PREPARED BY:	AT
Ext Wall Area SM	618	BUDGET:	Class 1 ES004
Exterior Perimeter M	73	Exterior Wall Ht M	8.47

A1 SUBSTRUCTURE \$ 239,411

A11 Foundations		331	m2	\$	723.38	\$	239,411
A111	Standard Foundations	331	m2	\$	385.26	\$	127,505
1	Concrete, Rebar, Formwork, Placing to Strip Footings	0	m3	\$	700.00		No Strip Footings
2	Concrete, Rebar, formwork, Placing Column Footings	0	m3	\$	800.00		Included in Pile Caps
3	Concrete, Rebar, Formwork to Grade Beams	38	m3	\$	1,013.64	\$	38,518
4	Concrete, Rebar, Formwork to Pilasters	13	m2	\$	1,045.45	\$	13,591
5	Concrete, Rebar, Formwork to Pile Caps	21	m3	\$	1,013.64	\$	21,286
6	Concrete, (Unspecified Other)	0	m3	\$	600.00	\$	-
7	Type 4 Rigid Insulation to Foundations	133	m2	\$	17.75	\$	2,361
8	Waterproofing Membrane	133	m2	\$	140.00	\$	18,620
9	Trench Excavation Foundations - Common	288	m3	\$	20.00	\$	5,760
10	Trench Excavation Foundations - Rock	0	m3	\$	110.00		Not Applicable
11	E/O Trench Precautions at High Voltage Lines Transversing Bld'g	32	Hr	\$	590.66	\$	18,901
12	Backfill Foundations with On Site Material	288	m3	\$	15.00	\$	4,320
13	E/O Backfill Grade Beams with Imported Granular (PEI Soils)	86	m3	\$	48.00	\$	4,147
14	Drain Tile c/w Granular & Filter Fabric	0	m	\$	18.00		Not Applicable
A112	Piled Foundations	0		\$	-	\$	111,906
1	Concrete, Rebar, Formwork, - House Keeping / Transformer Bases	1.3	m3	\$	924.00	\$	1,155
2	Steel H- Piles (HP250 x 85)	21	Ea	\$	5,273.86	\$	110,751
3	Trench Excavation Pile Caps Bases - Common	0	m3	\$	20.00	\$	-
4	Trench Excavation Equipment Bases - Rock	0	m3	\$	110.00		Not Applicable
5	Backfill Equipment Bases with on Site Material	0	m3	\$	10.00		Not Applicable
6	Backfill Equipment Bases with Imported Granular	0	m3	\$	48.00		Not Applicable
A12	Basement Excavation	1	m2	\$	-	\$	-
1	Mass Excavation - Common	0	m3	\$	9.00		Not Applicable
2	Mass Excavation - Rock	0	m3	\$	90.00		Not Applicable
3	Mass Excavation - Unsuitables	0	m3	\$	6.00		Not Applicable
4	Backfill Foundations	0	m3	\$	9.00		Not Applicable

A2 STRUCTURE

\$ 168,204

A21 First Floor Construction 331 m2 \$ 107.36 \$ 35,532

A21.1	250 mm Floor Slab	331	m2	\$ 95	\$	31,357
1	Concrete Slab on Grade	88	m3	\$ 290.00	\$	25,520
2	Rebar to Slab on Grade	0	kg	\$ 2.75		Included in SOG
3	WW Mesh to Slab on Grade	0	m2	\$ 3.80		Not Applicable
4	Screed, trowel, and cure to slabs	353	m2	\$ 9.00	\$	3,177
5	Sawcut control joints	0	m	\$ 5.00	\$	-
6	Joint filler at slab edge	0	m	\$ 5.00	\$	-
7	Sealant to control joints	0	m	\$ 5.00	\$	-
8	6 mil vapour barrier	353	m2	\$ 1.50	\$	530
9	50mm rigid insulation for radiant heat	0	m2	\$ 23.00		Not Applicable
10	Granular underside of slab	71	m3	\$ 30.00	\$	2,130

A21.4	Miscellaneous	1	m2	\$ 4,175.00	\$	4,175
1	Trench for underslab m/e services	20	m3	\$ 65.00	\$	1,300
2	Slab thickening at masonry walls	5	m3	\$ 575.00	\$	2,875
3		0				

A22 Upper Floor Construction 1 m2 \$ - \$ -

A221.1	Main Level Slab above Basement	0	m2	\$ -	\$ -	
1	Concrete, Rebar, Formwork to Columns	0	m3	\$ 900.00		Not Applicable
2	Concrete, Rebar, Formwork to Suspended Slab (200 mm)	0	m2	\$ 275.00		Not Applicable
3	Screed, Trowel and Cure Concrete Slab	0	m2	\$ 9.00		Not Applicable

A221.2	Second Floor Construction	0	m2	#DIV/0!	\$ -	
1	Structural steel columns, beams, OWSJ framing	0	tonnes	\$ 4,295.71		Included in Roof Framing
2	38mm composite LZC metal floor deck	0	m2	\$ 40.00	\$	
3	Concrete Topping Slab 100 mm thickness	0	m3	\$ 290.00	\$	
4	Mesh to Topping Slab	0	m2	\$ 3.80	\$	
5	Screed, Trowel and Cure Concrete Slab	0	m2	\$ 9.00	\$	
6	Concrete, Rebar, Formwork to Elevator Core Walls	0	m3	\$ 800.00		Not Applicable
7	Fireproofing to Steel Beams, OWSJ, and Deck	0	m2	\$ 35.00	\$	
8	Fireproofing to Steel Columns - 2 layers of drywall	0	m2	\$ 9.00	\$	
9	Expansion Joint Assemblies	0	m	\$ 300.00	\$	

A222	Stair Construction	1	m2	\$ -	\$ -	
1	Metal Stairs c/w Pipe Handrails	0	Risers	\$ 400.00	\$	

A23 Roof Construction 331 m2 \$ 401 \$ 132,672

A23.1	Main Roof Framing	331	m2	\$ 401	\$	132,672
1	Structural Steel Columns, Beams & OWSJ Framing	32	tonnes	\$ 3,700	\$	118,400
2	Structural Post Disaster Factor		%	0%		Deleted
3	38mm LZC Metal Roof Deck	357	m2	\$ 40	\$	14,272
4	Expansion Joint Assemblies	0	m	\$ 270		None Shown

A23.2	Low Roof Areas	1	m2	\$ -	\$ -	
1	Structural Steel Beams & Columns	0	tonnes	\$ 3,700.00		Included in 23.1 Main Roof
2	11/2" LZC metal roof deck	0	m2	\$ 40.00	\$	

A3 EXTERIOR ENCLOSURE**\$ 307,868**

A31 Walls Below Grade	0	m2	\$	-	Not Applicable
1 Waterproofing membrane at basement	0	m2	\$	32.00	\$ -
2 Protection board	0	m2	\$	16.00	\$ -
A32 Walls Above Grade	331	m2	\$	731	\$ 241,928
1 150 mm Exterior Wall Concrete Block	0	m2	\$	116.57	\$
2 Post-Disaster Factor	10% %			10%	\$
3 Reinforced with 10M @ 600 mm c/c	0	kg	\$	2.75	Included in Wall
4 Grouted cores solid @ 600 c/c	0	m3	\$	550.00	Included in Wall
5 Masonry lateral support ties to structural steel	0	no	\$	35.00	Included in Masonry
6 Air/vapour barrier - Peel & Stick	0	m2	\$	32.28	\$
7 89 mm Rigid Insulation	0	m2	\$	35.00	\$
8 100mm Insulated Metal Panel	618	m2	\$	391.27	\$ 241,928
A33 Windows	331	m2	\$	3.11	\$ 1,030
1 Clear Anodized Triple Glazed Aluminum Fixed Windows	1	Ea	\$	1,029.66	\$ 1,030
2 Aluminum entrances complete	0	m2	\$	1,250.00	\$
3 Power operators included by Div 16	0	no			\$
4 Sectional overhead doors c/w operators	0	m2	\$	350.00	\$
5 IHM Doors c/w Hardware & Vision lite	0	no	\$	1,700.00	\$
6 IHM Double Doors c/w Hardware & Vision lite	0	no	\$	2,100.00	\$
7 Ambulance entrance sliding doors	0	no	\$	15,000.00	\$
A34 Roof Coverings	332	m2	\$	196	\$ 64,910
A34.1 High Roof - Elev 7.8	331	m2	\$	196	\$ 64,910
1 2 ply Modified Bituminous Roof System	331	m2	\$	122.27	\$ 40,467
2 1/2" Exterior Drywall Screwed to Metal deck	331	m2	\$	7.00	\$ 2,317
3 Parapet & Wall to Roof Intersect (PT Blocking & Cants)	73	m	\$	49.20	\$ 3,592
4 Metal Flashings & Trims	73	m2	\$	48.42	\$ 3,535
5 Fall Restraint / Arrest System	3	item	\$	5,000.00	\$ 15,000
A34.2 Low Roof Areas - Elev. 4.2	1	m2	\$		\$
1 2 ply Modified Bituminous Roof System	0	m2	\$	122.27	\$
2 1/2" Exterior Drywall Screwed to Metal deck	0	m2	\$	7.00	\$
3 Parapet & Wall to Roof Intersect (PT Blocking & Cants)	0	m	\$	49.20	\$
4 Metal Flashings & Trims	0	m2	\$	48.42	\$
5 Fall Restraint / Arrest System	0	item	\$	5,000.00	\$
A35 Projections	0	m2	\$	-	Not Applicable

B1 Partitions and Doors	\$ 56,789
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B11 Partitions	434	m2	\$	87	\$	37,607
<hr/>						
B111.1 150 mm Concrete Block Interior Partitions	242	m2	\$	112.23	\$	27,158
1 150 mm Interior Wall Concrete Block	242	m2	\$	105.00	\$	25,408
1 Masonry lateral support	50	no	\$	35.00	\$	1,750
	0					
<hr/>						
B111.2 P1 - 92 mm Steel Stud GB Partitions	192	m2	\$	54.52	\$	10,449
1 15.9 mm gypsum board	192	m2	\$	21.52	\$	4,125
2 92 mm steel stud @ 400 c/c	639	m	\$	7.50	\$	4,792
3 89 mm mineral fibre sound batt	192	m2	\$	8.00	\$	1,533
<hr/>						
B12 Exterior, Interior, Overhead Doors and Screens	331	m2	\$	58	\$	19,182
<hr/>						
1 IHM Doors, Frame & Hardware	6	no	\$	1,045.45	\$	6,272.73
2 HM Door, Frame & Hardware	6	no	\$	818.18	\$	4,909.09
3 SCW Door, Frame & Hardware	0	no	\$	818.18	\$	-
4 Glazed sidelites in hollow metal frames	0	m2	\$	300.00	\$	-
5 3050 x 3050 Sectional coiled Overhead Doors	1	no	\$	8,000.00	\$	8,000.00

B2 INTERIOR FINISHES	\$ 36,129
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B21 Floor Finishes	331	m2	\$	79	\$	26,157
<hr/>						
1 Safety Sheet Vinyl Slip Resistant Flooring	6	m2	\$	143.48	\$	920
2 Safety Sheet Vinyl Coved Base	0	m	\$	45.00	\$	-
3 Rm 116 Lab Quarry Floor Tile in Lab	6	m2	\$	107.60	\$	690
4 Stair Treads and Landings	0	m2	\$	150.00	\$	-
9 Rm 111 Non-Metallic Floor Hardener in Workshop	90	m2	\$	21.52	\$	1,937
10 Rm 117 Water Treatment Epoxy Floor Finish	210	m2	\$	107.60	\$	22,610
11 Unpainted concrete	24	m2	\$	-	\$	-
<hr/>						
B22 Ceiling Finishes	12	m2	\$	78	\$	966
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B22.1 Suspended Drywall Ceilings	6	m2	\$	69.00	\$	414
1 Furring channels suspended at 600 c/c	6	m	\$	7.00	\$	42
2 13mm drywall	6	m2	\$	24.00	\$	144
3 Taping & sanding	6	m2	\$	20.00	\$	120
4 Prime and 2 coats paint finish	6	m2	\$	18.00	\$	108
<hr/>						
B22.2 Acoustic Suspended Ceiling	6	m2	\$	86.08	\$	552
1 Suspended Acoustical Ceilings 2.75 AFF	6	m2	\$	86.08	\$	552
<hr/>						
B22.3 Place Holder	1	m2	\$	-	\$	-
1 Place Holder	0	m2	\$	-	\$	-
<hr/>						
B23 Wall Finishes	867	m2	\$	10	\$	9,005
<hr/>						
1 Prime and 2 coats Paint to Drywall	383	m2	\$	8.61	\$	3,300
2 Prime and 2 coats Paint to Concrete Block	484	m2	\$	8.07	\$	3,906
3 Prime and 2 coats Paint to Man Doors & Frames	12	Ea	\$	125.00	\$	1,500
4 Prime and 2 coats Paint to Overhead Doors	1	Ea	\$	300.00	\$	300
5 Prime & Paint Washroom	0	m2	\$	8.61	\$	-

B3 FITTINGS AND EQUIPMENT**\$ 37,025**

B31 Fittings and Fixtures		331	m2	\$	111.87	\$	37,025
B311	Miscellaneous Metals	331	m2	\$	92.01	\$	30,450
1	Overhead Door Channel Frames	1	Ea	\$	2,650.00	\$	2,650
2	Interior Bollards Bolted to Concrete	4	no	\$	450.00	\$	1,800
3	Access Ladder c/w Cage	1	m	\$	10,000.00	\$	10,000
4	Access Platform for Process, Mech, Electrical	2	Ea	\$	8,000.00	\$	16,000
B312	Millwork	331	m2	\$	5.89	\$	1,950
1	Room # 108 Vanity Washroom	0	m	\$	400.00		Delete from Budget
2	Room # 116 Lab Cupboards	2.6	m	\$	750.00	\$	1,950
3	Room # 111 Maintenance Storage Shelving	7	m	\$	500.00		Delete from Budget
4	Room # 113 Tool Room Storage	11	m	\$	500.00		Delete from Budget
5	Room # 112 CT Storage Room Shelves	24	m	\$	500.00		Delete from Budget
B313	Miscellaneous Specialties	331	m2	\$	13.97	\$	4,625
1	Washroom Accessories per WR	0	no	\$	500.00		Delete from Budget
5	Standard Metal Lockers	22	no	\$	187.50	\$	4,125
6	Shower room benches	0	no	\$	300.00		Delete from Budget
7	Shower room accessories	0	no	\$	200.00		Delete from Budget
8	Interior signage	1	item	\$	500.00	\$	500
9	Window Coverings	0	Ea	\$	150.00		None Shown
B32	Equipment	331	m2	\$	-	\$	-
B32.1	Workshop Equipment	0	LS	\$	-		By Owner
1	Work Benches	6	Ea	\$	-		By Owner
2	Lathe	1	Ea	\$	-		By Owner
3	Mill Machine	1	Ea	\$	-		By Owner
4	Drill Press	1	Ea	\$	-		By Owner
5	Bandsaw	1	Ea	\$	-		By Owner
B32.2	Loading Dock Equipment	1	no	\$	-	\$	-
1	Loading Door Seals & Bumpers	1	item	\$	5,000.00		None Shown
B32.3	Place Holder	1	m2	\$	-	\$	-
1	Place Holder	0		\$	-	\$	-
B32.4	Office Furniture	3	Ea	\$	-	\$	-
1	Desk Chair, Shelving	3	Ea	\$	1,500.00		By Owner
B33	Conveying Systems	331	m2	\$	-	\$	-
1	Monorail Framing	0	m	\$	1,409.09		Delete from Budget

C1 MECHANICAL - BUILDING**\$ 83,038**

C11 Plumbing and Drainage		331	m2	\$	75	\$	24,700
1	P-1-WC	0	ea	\$	1,500	\$	-
2	P-2_Lav	0	no	\$	1,200	\$	-
3	P-3_SH	0	no	\$	1,500	\$	-
4	P-4_SK	1	no	\$	1,200	\$	1,200
5	P-5_EW	1	no	\$	1,500	\$	1,500
6	P-6_ES (relocated from existing bldg)	1	no	\$	1,000	\$	1,000
7	P-7_UR	0	no	\$	1,500	\$	-
8	P-8_MS	1	no	\$	1,500	\$	1,500
9	Floor Drain	5	no	\$	500	\$	2,500
10	4" BFP-building entrance	1	ea	\$	5,000	\$	5,000
11	3" BFP-RO units (relocated from existing bldg, recertify)	1	ea	\$	1,000	\$	1,000
12	3" DCW to RO unit	75	ft	\$	75	\$	5,625
13	Roof Drain	4	ea	\$	500	\$	2,000
14	RWL	75	ft	\$	25	\$	1,875
15	HB	2	ea	\$	250	\$	500
16	Future Sink and coffe stn	0	ea	\$	500	\$	-
17	AC-01, 02, 03 condensate drain	0	ea	\$	100	\$	-
18	DHW Tank-remove and reinstall	1	ea	\$	1,000	\$	1,000

C12 Fire Protection		331	m2	\$	91	\$	30,088
1	Wet pipe system	372	m2	\$	54	\$	20,088
2	150mm double check valve	1	ea	\$	10,000	\$	10,000

C13 HVAC		331	m2	\$	85	\$	28,250
C13.1 Heating		331	m2	\$	20	\$	6,750
1	Baseboard heaters (with t-stat)	1	ea	\$	750	\$	750
2	Unit heaters (with t-stat)	4	ea	\$	1,500	\$	6,000
3		0	m2	\$	-	\$	-
C13.2 Ventilation, Air conditioning		331	m2	\$	65	\$	21,500
1	HRV-01	0	ea	\$	20,000	\$	-
2	Ductwork	0	ls	\$	10,000	\$	-
3	Diffusers	0	ea	\$	250	\$	-
4	Controls	0	ls	\$	2,500	\$	-
5	Ductheater	0	ea	\$	2,500	\$	-
6				\$	-	\$	-
7	HRV-02	1	ea	\$	1,500	\$	1,500
8	Ductwork	1	ls	\$	2,500	\$	2,500
9	Diffusers	7	ea	\$	250	\$	1,750
10	Controls	1	ls	\$	1,500	\$	1,500
11	Ductheater	1	ls	\$	1,500	\$	1,500
12	Louvers & damper	2	ea	\$	1,500	\$	3,000
12	Fire dampers	2	ea	\$	250	\$	500
13	CU-01/AC-1, 2, 3	0	ls	\$	7,500	\$	-
14	Refrigeration piping	0	ls	\$	2,000	\$	-
15	Controls	0	ls	\$	2,500	\$	-
16	EF-01 (Workshop)	0	ea	\$	2,500	\$	-
17	Louver	0	ea	\$	1,000	\$	-
18	Motorized Dampers	0	ea	\$	750	\$	-
19	Controls	0	ls	\$	1,000	\$	-
20	EF-02 (Electrical Room)	1	ea	\$	2,500	\$	2,500
21	Louver	2	ea	\$	1,000	\$	2,000
22	Motorized Dampers	2	ea	\$	750	\$	1,500
23	Controls	1	ls	\$	1,000	\$	1,000
22	Tagging/Labeling	1	ea	\$	750	\$	750
23	Air balancing	1	ea	\$	1,500	\$	1,500

C1A MECHANICAL - PROCESS**\$ 562,000**

C15 Process		331	sm	\$ 1,698.09	\$	562,000
1	Water Treatment (Inside)	1	LS	\$ 312,235	\$	312,235
2	Water Treatment (Outside)	1	LS	\$ 95,000	\$	95,000
3	Compressed Air	1	LS	\$ 41,000	\$	41,000
4	Oil Water Separator	1	LS	\$ 45,765	\$	45,765
5	Water Treatment System Removal	1	LS	\$ 60,000	\$	60,000
6	Compressed Air System Removal	1	LS	\$ 8,000	\$	8,000

C2 ELECTRICAL c/w INSTRUMENTATION & CONTROLS**\$ 870,393**

C21 Electrical Disconnects & Demolition		331	m2	\$ 63.71	\$	21,084
1	Disconnect Existing MCC (BOP-MCC-01)	8	ea	\$ 329.41	\$	2,635
2	Disconnect Existing Switchgear (DP600-001)	1	ea	\$ 627.45	\$	627
3	Disconnect Existing Transfer Switch (DP600-02)	1	ea	\$ 627.45	\$	627
4	Disconnect Existing 125VDC Charger Unit	1	ea	\$ 658.82	\$	659
5	Disconnect Existing Lighting Contactor Panel	1	ea	\$ 164.71	\$	165
6	Disconnect Waste Water Collection Tank Control Panel	1	ea	\$ 329.41	\$	329
7	Disconnect RO Train VFD's	2	ea	\$ 627.45	\$	1,255
8	Disconnect existing 900kVA Generators	2	ea	\$ 658.82	\$	1,318
9	Disconnect Existing BOP Distribution Panel DP-01	1	ea	\$ 549.05	\$	549
10	Disconnect Existing Waste water Pump Controller and Monitor	1	ea	\$ 329.41	\$	329
11	Disconnect Existing Fuel Oil Heater Control Panel	1	ea	\$ 329.41	\$	329
12	Disconnect Existing General Distribution Transformer T-02	1	ea	\$ 414.32	\$	414
13	Disconnect Existing General Lighting Transformer T-03	1	ea	\$ 385.25	\$	385
14	Disconnect Existing Lighting Distribution Panel LP-01	1	ea	\$ 549.05	\$	549
15	Disconnect Existing BOP PLC Cabinet	1	ea	\$ -	\$	-
16	Disconnect Existing MECL RTU-01	1	ea	\$ -	\$	-
17	Disconnect Existing RO/EDI Skid	2	ea	\$ -	\$	-
18	Disconnect Existing Transfer Pumps	2	ea	\$ 164.71	\$	329
19	Disconnect Existing Dryers	2	ea	\$ 164.71	\$	329
20	Disconnect Existing Compressors	2	ea	\$ 164.71	\$	329
21	Disconnect Existing Demin Pumps	2	ea	\$ 164.71	\$	329
22	Disconnect Existing Neutral Grounding Resistor	1	ea	\$ 329.41	\$	329
35	Cable Pulled back to Corner					
36	3C #6 AWG Teck90 (Pull Back for Re-use)	645	m	\$ 8.24	\$	5,312
		120	m		\$	-
		120	m		\$	-
		135	m		\$	-
		135	m		\$	-
		135	m		\$	-
37	3C #10 AWG Teck90 (Pull back for re-use)	480	m	\$ 8.24	\$	3,953
	C0016	120	m		\$	-
	C0017	120	m		\$	-
	C0018	120	m		\$	-
	C0019	120	m		\$	-

C22 Relocate Existing Equipment		331	m2	\$ 30.85	\$	10,212
1	Relocate Existing Switchgear (DP600-001)	1	ea	\$ 1,317.65	\$	1,318
2	Relocate Existing Transfer Switch (DP600-02)	1	ea	\$ 1,317.65	\$	1,318
3	Relocate Existing NGR	1	ea	\$ 1,317.65	\$	1,318
4	Relocate RO Train VFD's	2	ea	\$ 1,317.65	\$	2,635
5	Relocate Fuel oil heater panel	1	ea	\$ 658.82	\$	659
6	Relocate Existing MCC	1	ea	\$ 1,976.47	\$	1,976
7	Relocate Existing DC Unit	1	ea	\$ 988.24	\$	988

C23 Installations New Building

	331	m2	\$	2,131	\$	705,402
1 EQUIPMENT						
2 Resued MCC (BOP-MCC-01)	1	ea	\$	3,952.94	\$	3,953
3 Place Existing Switchgear (DP600-001)	1	ea	\$	1,317.65	\$	1,318
4 Place Existing Transfer Switch (DP600-02)	1	ea	\$	1,317.65	\$	1,318
5 Reused125VDC Charger Unit	1	ea	\$	658.82	\$	659
6 New Exterior Lighting Contactor Panel	1	ea	\$	1,329.41	\$	1,329
7 Place RO Train VFD's	2	ea	\$	2,486.15	\$	4,972
8 New 750kVA GENERATOR	1	ea	\$	194,141.18	\$	194,141
9 Unit Service Transformer (PROVIDED BY MECL)	1	ea	\$	2,635.29	\$	2,635
10 347/600V, 225A, 3ph Panel (LP-01)		ea	\$	7,198.01	\$	-
11 600V, 60A, 3ph Panel (LP-02)	1	ea	\$	7,198.01	\$	7,198
12 120/208V, 225A, 3ph Panel (DP-01)	1	ea	\$	3,698.01	\$	3,698
13 120/240V, 100A, 1ph Panel (DP-02)		ea	\$	3,498.01	\$	-
14 Panel (DP-01B)	1	ea	\$	7,198.01	\$	7,198
15 New 45kVA Transformer (T-02)	1	ea	\$	3,847.06	\$	3,847
16 New 75kVA, 600-347/600V Transformer (T-03)	1	ea	\$	5,882.34	\$	5,882
17 New 30kVA Transformer (T-05)		ea	\$	3,464.07	\$	-
18 Cable Ductbank	20	Ft	\$	182.35	\$	3,647
19 Cable Tray (24" wide)	21	10'	\$	285.77	\$	6,001
20 Cable Tray (90deg elbow) (24")	10	ea	\$	536.25	\$	5,362
21 Cable Tray Tee Section (24")	2	ea	\$	684.48	\$	1,369
23 Uni-strut Support System	2	ea	\$	300	\$	600
23 Lights					\$	-
24 Type L1 (4' strip pendant)	20	ea	\$	377	\$	7,550
25 Type L2 (1'x4' pendant)	2	ea	\$	248	\$	497
26 Type L3 (2'x4' pendant)	2	ea	\$	416	\$	831
28 Type L4 (shower potlight)	0	ea	\$	182	\$	-
29 Type L5 (High bay)	24		\$	467	\$	11,208
30 Type L6 (wall pack)	7	ea	\$	366	\$	2,561
31 EXIT	7	ea	\$	250	\$	1,748
32 Emergency (Battery Packs)	6	ea	\$	390	\$	2,338
34 Emergency (Remote Heads)	11	ea	\$	125	\$	1,372
32 Life Safety Systems					\$	-
33 Pull Stations	4	ea	\$	160	\$	638
34 Horn/strobes	8	ea	\$	240	\$	1,916
35 Smoke Detector	8	ea	\$	300	\$	2,396
36 Fire Alarm Control Panel (FACP)	1	ea	\$	5,315	\$	5,315
37 3/4" Conduit	2000	lf	\$	8	\$	15,180
38 18-2 Cables	20	c.l.f.	\$	213	\$	4,250
39 Fire Alarm Verification	1	Lot	\$	1,647	\$	1,647
40 CABLES					\$	-
41 Cable Installed in Trench/Cable Tray (Reused Cables)					\$	-
42 3C #6 AWG Teck90 (Installed in trench / Cable Tray)	645	m	\$	8.01	\$	5,164
C0020	120	m	\$	-	\$	-
C0021	120	m	\$	-	\$	-
C0022	135	m	\$	-	\$	-
C0023	135	m	\$	-	\$	-
C0024	135	m	\$	-	\$	-
42 3C #10 AWG Teck90 (Installed in trench / Cable Tray)	480	m	\$	8.01	\$	3,843
C0016	120	m	\$	-	\$	-
C0017	120	m	\$	-	\$	-
C0018	120	m	\$	-	\$	-
C0019	120	m	\$	-	\$	-
43 15kV Cables					\$	-
3C #2 AWG Teck90	110	m	\$	92	\$	10,166.26
	110	m	\$	-	\$	-

44	Low Voltage Cables					\$		-
45	1C 750kcmil RW90 (Re-install) C0005	6	m	\$	165	\$		988.24
46	3C 500kcmil Teck90	420	m	\$	211	\$		88,817.65
47	3C 350kcmil Teck90	28	m	\$	132	\$		3,693.22
48	3C 750kcmil Teck	246	m	\$	264	\$		65,059.76
		180	m					
		66	m					
49	3C #6 AWG Teck90							
50	4C 1/0 AWG Teck90	2	m	\$	95	\$		189.68
51	4C #3 AWG Teck90	2	m	\$	65	\$		130.76
52	3C #8 AWG Teck90	39	m	\$	34	\$		1,312.58
53	3C #4 AWG Teck90	50	m	\$	36	\$		1,783.23
53	3C #10 AWG Teck90	270	m	\$	31	\$		8,453.65
54	3C #10 AWG Teck9 (Heat Trace)	120	m	\$	23	\$		2,768.94
55	3C #12 AWG Teck90	10	m	\$	54	\$		542.21
55	3C #1/0 AWG Teck90	10	m	\$	-	\$		-
		0	m	\$	73	\$		-
57	Teck Connector (21mm) (#12 - #10)	6	ea	\$	81	\$		485.44
58	Teck Connector (27mm) (#8)	8	ea	\$	159	\$		1,271.52
59	Teck Connector (41mm) (#6-#1)	4	ea	\$	211	\$		845.48
60	Teck Connector (53mm) (1/0-4/0)	4	ea	\$	374	\$		1,497.30
61	Teck Connector (63mm) (250-400)	6	ea	\$	481	\$		2,885.69
62	Teck Connector (78mm) (500-750)	21	ea	\$	547	\$		11,488.24
63	Terminations	0	ea	\$	-	\$		-
65	Grounding System					\$		-
66	#4/0 Bare Copper Grounding Conductor	280	m	\$	40	\$		11,080
67	#2/0 Bare Copper Grounding Conductor	80	m	\$	26	\$		2,082
68	I-beam Grounding Clamp	8	ea	\$	82	\$		659
69	Mechanical Compression Grounding Connection	6	ea	\$	98	\$		585
70	Copper Ground Bar	1	ea	\$	287	\$		287
71	Copper Crimp type compression connector	15	ea	\$	82	\$		1,235
72	Copper Clad grounding rod	14	ea	\$	178	\$		2,490
						\$		-
73	Wiring Devices					\$		-
74	15A 125V Duplex Receptacle	5	ea	\$	110	\$		549.26
75	15/20A 125V Duplex Receptacle	20	ea	\$	120	\$		2,397.06
76	15A 125V GFCI Duplex Receptacle	1	ea	\$	122	\$		122.35
77	15/20A 125V GFCI Duplex Receptacle	2	ea	\$	126	\$		251.71
78	Voice/Data Outlet	1	ea	\$	255	\$		254.91
79	Toggle Switch	11	ea	\$	101	\$		1,111.58
80	Dimmer Switch	0	ea	\$	41	\$		-
81	Occupancy Sensor	1	ea	\$	161	\$		161.35
82	3/4" Conduit	2000	lf	\$	8	\$		15,180.00
83	18-2 Cables	20	c.l.f.	\$	213	\$		4,250.00
84	wall mounted data rack w/ switch	1	lot	\$	6,976	\$		6,976.47
85	Heat Trace	400	m	\$	110	\$		44,000
	Commissioning							
	Switchgear and transfer switch	1	LS	\$	1,976	\$		1,976.47
	MCC	1	LS	\$	6,588	\$		6,588.24
	Generator	1	LS	\$	1,318	\$		1,317.65
	Building Systems	1	LS	\$	3,294	\$		3,294.12
82	Equipment Rental							
83	Scissor Lifts		Weeks	\$	500			Included in Units
84	Crane		Weeks	\$	4,000			Included in Units
85	15% Subcontractor Overhead and Profit		15%	\$	72,311	\$		72,311

C19 Instrumentation and Controls

331 m2 \$ 404 \$ 133,695

EQUIPMENT

1	MECL RTU No. 1 - WATER TREATMENT	ea	\$	2,560.00	\$	1,506
2	MECL RTU No. 2 - 13.8 kV SWITCHGEAR	ea	\$	-	\$	-
3	PLC-BOP-01 CONTROL PANEL	ea	\$	2,560.00	\$	1,506
4	FIELD JUNCTION BOX IJB-001	ea	\$	1,280.00	\$	753
5	DEMIN WATER PUMP CONTROL STATION JB-403	ea	\$	640.00	\$	376
6	RO1 PUMP VFD	ea	\$	2,560.00	\$	1,506
7	RO2 PUMP VFD	ea	\$	2,560.00	\$	1,506
8	RO/EDI NO. 1 PLC CONTROL PANEL	lot	\$	-	\$	824
9	RO/EDI NO. 2 PLC CONTROL PANEL	ea	\$	-	\$	824
10	WATER SOFTNERS CONTROL PANEL	ea	\$	1,280.00	\$	753
11	CIP PUMP CONTROL PANEL	ea	\$	1,280.00	\$	753
12	WW SUMP JUNCTION BOX WWP-JB-01	ea	\$	640.00	\$	376
13	ILS-350 MONITOR	ea	\$	-	\$	753
14	WASTE WATER PUMP CONTROLLER	lot	\$	1,280.00	\$	753
15	JUNCTION BOX JB-LFO-01 - FUEL TRANSFER	ea	\$	1,280.00	\$	824
16	PLC REMOTE I/O PANEL JB-LFO-02- FUEL TRANSFER	ea	\$	-	\$	824
17	LFO HEATER CONTROL PANEL LFO-HCP-01	ea	\$	-	\$	1,506
18	INSTRUMENT STANDS	ea	\$	2,560.00	\$	1,376
19	CONTROL PANEL/JUNCTION BOXES SUPPORT FRAMES	ea	\$	820.00	\$	4,012
20	INSTRUMENT RELOCATION	lot	\$	6,120.00	\$	2,259
21	MISCELLANEOUS HARDWARE AND SUPPORTS	lot	\$	3,840.00	\$	3,353
22	INSTRUMENTS TESTING AND COMMISSIONING	lot	\$	5,000.00	\$	8,000
23	CONTROL SYSTEMS TESTING AND COMMISSIONING	lot	\$	13,600.00	\$	23,529

I&C CABLES

26	1-6C, #10AWG, Cu. Teck Cable (REMOVE)	120	m	\$	5.14	\$	617
27	1-6C, #10AWG, Cu. Teck Cable (RE-INSTALL)	120	m	\$	5.14	\$	617
28	Belden 9463, 1 Pair, Teck Armoured (REMOVE)	120	m	\$	4.78	\$	574
29	Belden 9463, 1 Pair, Teck Armoured (RE-INSTALL)	120	m	\$	4.78	\$	574
30	1-2C, #12AWG, Cu. Teck Cable (REMOVE)	120	m	\$	10.37	\$	1,245
31	1-2C, #12AWG, Cu. Teck Cable (RE-INSTALL)	120	m	\$	9.43	\$	1,132
32	1 Pair Type J TC Cable Teck Armour (REMOVE)	115	m	\$	4.78	\$	550
33	1 Pair Type J TC Cable Teck Armour (RE-INSTALL)	115	m	\$	4.78	\$	550
34	1 Pair Type K TC Cable Teck Armour (REMOVE)	115	m	\$	4.78	\$	550
35	1 Pair Type K TC Cable Teck Armour (RE-INSTALL)	115	m	\$	4.78	\$	550
36	Belden 121700A Cat5E Armoured Cable REMOVE	120	m	\$	4.78	\$	574
37	Belden 121700A Cat5E Armoured Cable RE-INSTALL	120	m	\$	4.78	\$	574
38	1 Pair #16AWG, Shielded Teck armoured cable (NEW)	72	m	\$	11.97	\$	862
39	1 Pair #18AWG, Shielded Teck armoured cable (NEW)	30	m	\$	10.80	\$	324
40	1 Pair, RS-485 Cable, Teck armoured (NEW)	34	m	\$	8.94	\$	304
41	6 Pair #16AWG, Twisted Shielded Pair (NEW)	37	m	\$	25.48	\$	943
42	1-10C, #14AWG, Teck Cable (NEW)	482	m	\$	35.06	\$	16,900
43	1-12C, #12AWG, Teck Cable (NEW)	15	m	\$	44.59	\$	669
44	1-15C, #14AWG, Teck Cable (NEW)	84	m	\$	27.26	\$	2,290
45	1-2C, #10AWG, Teck Cable (NEW)	40	m	\$	19.25	\$	770
46	1-2C, #14AWG, Teck Cable (NEW)	150	m	\$	19.00	\$	2,851
47	1-2C, #8AWG, Teck Cable (NEW)	20	m	\$	18.91	\$	378
48	1-30C, #14AWG, Teck Cable (NEW)	30	m	\$	40.36	\$	1,211
49	1-3C, #14AWG, Teck Cable (NEW)	72	m	\$	9.49	\$	684
	C-IAD01	20	m				
50	1-4C, #14AWG, Teck Cable (NEW)	40	m	\$	10.73	\$	429
51	1-5C, #14AWG, Teck Cable (NEW)	40	m	\$	12.61	\$	504
52	1-6C, #12AWG, Teck Cable (NEW)	20	m	\$	18.97	\$	379
53	1-6C, #14AWG, Teck Cable (NEW)	150	m	\$	26.14	\$	3,921
54	1-7C, #14AWG, Teck Cable (NEW)	10	m	\$	31.69	\$	317
55	1-9C, #14AWG, Teck Cable (NEW)	40	m	\$	35.06	\$	1,402
56	Belden 121700A Cat5E Armoured Cable (NEW)	146	m	\$	7.07	\$	1,032
57	Vendor Supplied Cable (NEW)	130	m	\$	37.14	\$	4,829
58	Teck Cable connectors	144	ea	\$	74.12	\$	10,673
59	Cable terminations	656	ea	\$	13.55	\$	8,891

60							
61	15% Subcontractor Overhead and Profit		15%		\$		2,241

D1 SITEWORK**\$ 347,240**

D11 Site Development		331	m2	\$	398	\$	131,855
D111	Preparation	331	m2	\$	57.73	\$	19,105
1	Strip topsoil & stockpile for reuse	0	m3	\$	5.00		Not Applicable
2	Strip existing asphalt are truck off site for reuse	0	m3	\$	15.00		Not Applicable
3	Cut/Fill Site Rough Grade to Subgrade	1008	m3	\$	8.00	\$	8,064
4	Proof Roll Building Area	331	m2	\$	3.00	\$	993
✓ 5	Stockpile Surplus Material on Site	1008	m3	\$	4.00	\$	4,032
6	Import shot rock fill material at footprint	0	m3	\$	30.00	\$	-
7	Environment Protection Sedment control	1	LS	\$	4,000.00	\$	4,000
8	Fine Grade Site outside Building Area	672	m2	\$	3.00	\$	2,016
D112	Asphalt & Granular Site Finishes	331	m2	\$	301.40	\$	99,750
1	120mm Asphalt Surface c/w 200 Class A Gran. Base (Dwg C-004)	900	m2	\$	90.00	\$	81,000
2	200mm Class A Granular Base (Dwg C-004)	225	m2	\$	30.00	\$	6,750
3	Bollards	8	Ea	\$	1,500.00	\$	12,000
D114	Landscaping	3,050	m2	\$	4.26	\$	13,000
1	Topsoil and Sod	550	m2	\$	10.00	\$	5,500
2	Topsoil and Hydroseed	2,500	m2	\$	3.00	\$	7,500
2	Plantings	0	no	\$	15,000.00		Not Applicable
3	Site furniture and signage	0	no	\$	10,000.00		Not Applicable
4	Flagpole complete	0	no	\$	5,000.00		Not Applicable
D12 Mechanical Site Services		331	m2	\$	286	\$	94,544
D12.1	Sanitary Sewer	60	m	\$	383	\$	22,997
1	New sanitary manholes complete	2	no	\$	4,000.00	\$	8,000
2	New 200mm PVC sanitary pipe	60	m	\$	70.00	\$	4,200
3	Connection at existing lines	1	no	\$	5,000.00	\$	5,000
4	Trench new sanitary line	195	m3	\$	12.00	\$	2,340
5	E/O rock excavation	0	m3	\$	110.00	\$	-
6	Backfill line with granular	47	m3	\$	35.00	\$	1,645
7	Backfill line with common (Select)	151	m3	\$	12.00	\$	1,812
8	Trench to remove existing abandoned lines	0	m3	\$	15.00	\$	-
9	Backfill abandoned line with common	0	m3	\$	12.00	\$	-
D12.2	Storm Sewer	100	m	\$	150.75	\$	15,075
1	New precast concrete catchbasin	2	no	\$	3,000.00	\$	6,000
2	New 450 mm DR35 storm pipe	40	m	\$	90.00	\$	3,600
3	Trench excavate new storm lines	75	m3	\$	12.00	\$	900
4	New 150mm French Drain c/w granular	25	m	\$	75.00	\$	1,875
5	Backfill line with granular	0	m3	\$	35.00	\$	-
6	Backfill line with common (Select?)	0	m3	\$	12.00	\$	-
7	Outfall grates & headwalls	1	no	\$	1,000.00	\$	1,000
8	Remove Existing Storm & Structure	1	no	\$	500.00	\$	500
9	Trench to remove existing abandoned lines	30	m3	\$	15.00	\$	450
10	Backfill abandoned line with common (Select)	30	m3	\$	25.00	\$	750
D12.3	Water System	110	m	\$	513.38	\$	56,472
1	New150mmx100mm Tapping Valve	1	no	\$	4,500.00	\$	4,500
2	Tie - into existing line	3	no	\$	5,000.00	\$	15,000
3	New 150mm PVC DR18 pipe	40	m	\$	80.00	\$	3,200
4	New 150mm PVC pipe fittings	6	no	\$	650.00	\$	3,900
5	New 100mm PVC DR18 pipe	70	m	\$	80.00	\$	5,600
6	New 100mm PVC pipe fittings	4	no	\$	450.00	\$	1,800
7	Trench excavation for new waterlines	261	m3	\$	12.00	\$	3,132
8	OWS excavation and backfill	1	no	\$	10,000.00	\$	10,000
9	Backfill line with granular	60	m3	\$	35.00	\$	2,100
10	Backfill line with common (Select)	200	m3	\$	25.00	\$	5,000
11	Cap Existing Lines	2	no	\$	1,000.00	\$	2,000
12	Backfill abandoned line with common (Select)	20	m3	\$	12.00	\$	240
13	Revised connection for building	0	no	\$	7,500.00		Not Applicable
14	Test & disinfect	0	item	\$	5,000.00		Not Applicable

D13 Electrical Site Services		331	m2	\$	365.12	\$	120,841
D13.1	Underground Plastibeton Trench System Duct Banks	35	m	\$	2,520	\$	88,183
1	Excavate - Plastibeton Trench System	101	m3	\$	20.00	\$	2,013
2	Granular Bedding	11	m3	\$	60.00	\$	676
3	Hand Triim & Set Leveling Blocks	13	Ea	\$	39.00	\$	494
4	Plastibeton Trench System	35	m	\$	2,299.17	\$	80,471
5	Form Concrete duct bank	0	m2	\$	75.00		Not Applicable
6	Supply & Place Concrete	0	m3	\$	290.00		Not Applicable
7	Rebar to Concrete Ductbank	0	kg	\$	2.75		Not Applicable
8	Backfill with Sand	22	m3	\$	45.00	\$	990.00
9	Backfill with Common	44	m3	\$	60.00	\$	2,640.00
10	E/O Marker Tape	50	m	\$	3.00	\$	150.00
11	2x10 PT blocking	50	m	\$	15.00	\$	750.00
D13.2	Transformer & Generator Pad	2	no	\$	16,329	\$	32,658
1	Reinforced Concrete Transformer Pad	10	m3	\$	1,175.00	\$	11,681
2	Reinforced Concrete Generator Pad	16	m3	\$	975.00	\$	15,873
3	Excavate Pads	74	m3	\$	20.00	\$	1,489
4	Clear Stone U/S Pads	55	m3	\$	60.00	\$	3,330
5	Backfill Common	19	m3	\$	15.00	\$	285

D2 ANCILLARY WORK - EQUIPMENT RELOCATATIONS	\$ 29,465
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D21 Equipment Relocations	331	m2	\$	89.03	\$	29,465
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D21.1	Demolitions	1	LS	\$	-	\$	-
	1 Asbestos Abatement	0	m2	\$	-		Not Applicable
	2 Demolish Structure Including Foundations	0	m2	\$	-		Not Applicable
	3 Sort and Separate Materials per LEED	0	item	\$	-		Not Applicable
	4 Dispose off-site	0	item	\$	-		Not Applicable
D21.2	Relocate Equipment Including Cranage and Transport	1	LS	\$	29,464.50	\$	29,465
			LS	\$	-	\$	-
NOXTK01	1 Demineralized Water Storage Tank 105,000lbs/955psf	1	Ea	\$	2,678	\$	2,678
NOXP03	2 CIP Tank (4'-6")	1	Ea	\$	1,580	\$	1,580
IAD01	3 Compressed Air Receivers (257lbs/82psf)	1	LS	\$	1,248	\$	1,248
IAC01	4 Compressor (1,065lbs / 85psf)	1	Ea	\$	1,248	\$	1,248
SWT01	5 Resin Tanks (8,500lbs/675psf)	2	Ea	\$	4,888	\$	9,776
CFTK02	6 Brine Tank (10,000/686psf)	1	Ea	\$	1,580	\$	1,580
CFTK03	7 Brine Tank (12,000/745psf)	1	Ea	\$	1,580	\$	1,580
NOXW01	8 RO/EDI #1 & 2 (8,000lbs/75psf)	2	Ea	\$	4,888	\$	9,776

Z1 GENERAL REQUIREMENTS AND ALLOWANCES	\$ 410,634
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Z11 General Requirements	331	m2	\$	413.58	\$	136,878
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1	General Contractor's Overheads			5%	\$	136,878	\$	2,737,560
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Z12 Contractor Fee	331	m2	\$	827.16	\$	273,756
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1	General Contractor's Profit			10%	\$	273,756		
2	Other Risk Factors - Contract Format, Owner, Consultant, Schedule			0%			Not Applicable	

Z2 ALLOWANCES	\$ 1,067,372
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Z21 Design Fees and Disbursements	331	m2	\$	2,274	\$	752,553
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1	Engineering Design (CBCL Bid) including extras					\$ 298,020		
	Revised Design Effort Estimate					\$ 130,000		
2	Engineering Construction Support (CBCL Bid)					\$ 89,755		
3	Owner Trade Labour (MECL RFP)					\$ 96,000		
4	Owner Supervision					\$ 100,000		
5	Design Fee Contingency (10%)					\$ 38,778		

Z22 Escalation Allowance - (Not Included)	331	m2	\$	-		
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1	Escalation Allowance - (Based on 2019 Canadian Dollars)			0%				
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Z23 Construction Contingencies	331	m2	\$	951	\$	314,819
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1	Design Development Construction Contingency			0%	\$	-		
2	CONSTRUCTION CONTINGENCY - C.O.'s - Note 2			10%	\$	314,819		

END OF WBS



MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Water Sys Removal
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	K. Phillip	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DISCIPLINE:	Mech-Process
		DATE:	May 14, 2019

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
Stainless Steel Pipe and Fittings							
Misc. Small Bore Piping	1	ls		\$ -	\$ 2,500	\$ 2,500	\$ 2,500
Tubing	1	ls		\$ -	\$ 1,500	\$ 1,500	\$ 1,500
Shop Handling Pipe for Fabrication - NPS 1-1/2, SS Sch 40	0	m		\$ -	\$ 12	\$ -	\$ -
Shop Handling Pipe for Fabrication - NPS 3, SS Sch 40	0	m		\$ -	\$ 15	\$ -	\$ -
Shop Welds - Socketweld - NPS 1-1/2, SS Sch 40	0	each		\$ -	\$ 121	\$ -	\$ -
Shop Welds - Manual Butt Welds - NPS 3, SS Sch 40	0	each		\$ -	\$ 219	\$ -	\$ -
Shop Welds - Manual Butt Welds - NPS 6, SS Sch 40	0	each		\$ -	\$ 363	\$ -	\$ -
Attaching Flanges - NPS 1-1/2, Flange, 304SS, CL. 150, RF	0	each		\$ -	\$ 109	\$ -	\$ -
Attaching Flanges - NPS 3, Flange, 304SS, CL. 150, RF	0	each		\$ -	\$ 213	\$ -	\$ -
Attaching Flanges - NPS 6, Flange, 304SS, CL. 150, RF	0	each		\$ -	\$ 363	\$ -	\$ -
Field Handling & Erecting Fabricated Spool Pieces - NPS 1,	5	m		\$ -	\$ 61	\$ 297	\$ 297
Field Handling & Erecting Fabricated Spool Pieces - NPS 1-	15	m		\$ -	\$ 68	\$ 1,028	\$ 1,028
Field Handling & Erecting Fabricated Spool Pieces - NPS 3,	145	m		\$ -	\$ 84	\$ 12,153	\$ 12,153
Field Handling & Erecting Fabricated Spool Pieces - NPS 6,	0	m		\$ -	\$ 102	\$ -	\$ -
Field Cuts - Pipe - NPS 1, Sch. 40, SW	2	ea		\$ -	\$ 31	\$ 63	\$ 63
Field Cuts - Pipe - NPS 1-1/2, Sch. 40, SW	5	ea		\$ -	\$ 31	\$ 157	\$ 157
Field Cuts - Pipe - NPS 3, 304 SS, Sch 40, Butt Weld	35	ea		\$ -	\$ 44	\$ 1,556	\$ 1,556
				\$ -	\$ -	\$ -	\$ -
NPS 1, Field Handling Valves & Bolt Up	0	each		\$ -	\$ 91	\$ -	\$ -
NPS 1-1/2, Field Handling Valves & Bolt Up	3	each		\$ -	\$ 91	\$ 272	\$ 272
NPS 3, Field Handling Valves & Bolt Up	25	each		\$ -	\$ 165	\$ 4,118	\$ 4,118
				\$ -	\$ -	\$ -	\$ -
Olets	0	ls	\$ 500	\$ -	\$ 1,500	\$ -	\$ -
Vents & Drains	0	ls	\$ 2,500	\$ -	\$ 2,500	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -
PVC & PP Pipe and Fittings							
Field Cuts - PVC Pipe - NPS 1, Sch. 80	0	ea		\$ -	\$ 24	\$ -	\$ -
Field Cuts - PVC Pipe - NPS 1-1/2, Sch. 80	4	ea		\$ -	\$ 24	\$ 96	\$ 96
Field Cuts - PVC Pipe - NPS 3, Sch 80	4	ea		\$ -	\$ 33	\$ 132	\$ 132
Field Cuts - PVC Pipe - NPS 4, Sch 80	4	ea		\$ -	\$ 44	\$ 175	\$ 175
Field Handling & Erecting Fabricated Spool Pieces - NPS 1,	0	m		\$ -	\$ 41	\$ -	\$ -
Field Handling & Erecting Fabricated Spool Pieces - NPS 1-	9	m		\$ -	\$ 45	\$ 401	\$ 401
Field Handling & Erecting Fabricated Spool Pieces - NPS 3,	13	m		\$ -	\$ 57	\$ 737	\$ 737
Field Handling & Erecting Fabricated Spool Pieces - NPS 4,	12	m		\$ -	\$ 63	\$ 754	\$ 754
				\$ -	\$ -	\$ -	\$ -
NPS 1, Field Handling Valves & Bolt Up	0	each		\$ -	\$ 91	\$ -	\$ -
NPS 1-1/2, Field Handling Valves & Bolt Up	2	each		\$ -	\$ 91	\$ 181	\$ 181
NPS 3, Field Handling Valves & Bolt Up	12	each		\$ -	\$ 165	\$ 1,976	\$ 1,976
				\$ -	\$ -	\$ -	\$ -
Equipment							
Removal Exist. Demin Transfer Pumps, pipe (to TP) and	30	man.hrs		\$ -	\$ 70	\$ 2,100	\$ 2,100
Removal Exist. Resin Tanks - (2 Total), pipe (to TP) and	20	man.hrs		\$ -	\$ 70	\$ 1,400	\$ 1,400
Removal Exist. Water Softeners - (2 Total)	50	man.hrs		\$ -	\$ 70	\$ 3,500	\$ 3,500
Removal Exist. Emergency Shower/Eyewash Station	2	man.hrs		\$ -	\$ 85	\$ 170	\$ 170
Removal CIP Tanks, pipe (to TP) and valves	16	man.hrs		\$ -	\$ 70	\$ 1,120	\$ 1,120
Remove Exist. RO Skids - (2 total)	110	man.hrs		\$ -	\$ 70	\$ 7,700	\$ 7,700
				\$ -	\$ -	\$ -	\$ -
Removal of Salt Platform	50	man.hrs		\$ -	\$ 70	\$ 3,500	\$ 3,500
Pipe Stand		each		\$ -	\$ -	\$ -	\$ -
Pipe Supports		each		\$ -	\$ -	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -
Hydro-Testing		LS		\$ -	\$ -	\$ -	\$ -
Commissioning		LS		\$ -	\$ -	\$ -	\$ -
				\$ -	\$ -	\$ -	\$ -

SUB-TOTAL				\$0.00	\$47,585.64	\$47,585.64
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MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Water Sys Removal
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	K. Phillip	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DISCIPLINE:	Mech-Process
		DATE:	May 14, 2019

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
Labour Adjustment Factors							
Working at Heights	0 to 4.4 m	LS			10%	\$4,758.56	\$4,758.56
Multi-Story Bldg.	Floors 1 & 2	LS			0%	\$0.00	\$0.00
congested area factor	Warehouse	LS			15%	\$7,137.85	\$7,137.85
Contingencies							
Design Development Contingency		LS			0%	\$0.00	\$0.00
SUB-TOTAL - A				\$0.00		\$59,482.05	\$59,482.05
Contractor OH&P					0%		\$0.00
SUB-TOTAL - B							\$59,482.06
Construction Contingency - C					0%		\$0.00
Water System removals TOTAL (A + B + C)							\$60,000.00



MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Air Sys Removal
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	K. Phillip	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DATE:	May 14, 2019
		DISCIPLINE:	Mech-Process

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
Stainless Steel Pipe and Fittings							
Handling & Erecting Straught Run Pipe - NPS 1/2, SS Sch	0	m		\$ -	\$ 64	\$ -	\$ -
Handling & Erecting Straught Run Pipe - NPS 3/4, SS Sch	0	m		\$ -	\$ 68	\$ -	\$ -
Handling & Erecting Straught Run Pipe - NPS 1, SS Sch 80	46	m		\$ -	\$ 71	\$ 3,268	\$ 3,268
Thread Pipe (incl. cut) - NPS 1/2 to NPS 2, Sch. 80	0	ea		\$ -	\$ 34	\$ -	\$ -
				\$ -		\$ -	\$ -
NPS 1/2, Field Handling Valves		each		\$ -	\$ 16	\$ -	\$ -
NPS 3/4, Field Handling Valves		each		\$ -	\$ 16	\$ -	\$ -
NPS 1, Field Handling Valves	10	each		\$ -	\$ 25	\$ 247	\$ 247
Field Cuts - Pipe - NPS 1, Sch. 40, SW	10	ea		\$ -	\$ 31	\$ 315	\$ 315
Equipment							
Remove Exist. Air Compressors - (2 Total)	10	hrs		\$ -	\$ 70	\$ 700	\$ 700
Remove Exist. Air Receivers - (2 Total)	10	hrs		\$ -	\$ 70	\$ 700	\$ 700
Remove Exist. Air Dryers - (2 Total)	10	hrs		\$ -	\$ 70	\$ 700	\$ 700
				\$ -		\$ -	\$ -
				\$ -		\$ -	\$ -
Pump stand		each		\$ -		\$ -	\$ -
Pipe Stand		each		\$ -		\$ -	\$ -
Pipe Supports		each		\$ -		\$ -	\$ -
				\$ -		\$ -	\$ -
Hydro-Testing		LS		\$ -	\$ 2,500	\$ -	\$ -
Commissioning		LS		\$ -	\$ 2,500	\$ -	\$ -

SUB-TOTAL					\$0.00	\$5,930.05	\$5,930.05
Labour Adjustment Factors							
Working at Heights	0 to 4.4 m	LS			10%	\$593.00	\$593.00
Multi-Story Bldg.	Floors 1 & 2	LS			0%	\$0.00	\$0.00
congested area factor	Warehouse	LS			15%	\$889.51	\$889.51
Contingencies							
Design Development Contingency		LS			0%	\$0.00	\$0.00

SUB-TOTAL - A					\$0.00	\$7,412.56	\$7,412.56
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Contractor OH&P						0%	\$0.00
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SUB-TOTAL - B							\$7,412.56
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Construction Contingency - C						0%	\$0.00
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Air System Removals TOTAL (A + B + C)							\$8,000.00
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MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Water treatment (in)
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	KAC	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DISCIPLINE:	Mech-Process
		DATE:	May 14, 2019

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
Stainless Steel Pipe and Fittings							
Misc. Small Bore Piping Tubing	1	ls	\$ -	\$ -	\$ 2,500	\$ 2,500	\$ 2,500
	1	ls	\$ -	\$ -	\$ 2,500	\$ 2,500	\$ 2,500
NPS 1, Type 304 Stainless Pipe, Sch 40S	58	m	\$ 39	\$ 2,264		\$ -	\$ 2,264
NPS 1, 90° Elbow, 304 SS, 3000#	23	each	\$ 40	\$ 920		\$ -	\$ 920
NPS 1, Tee, 304 SS, 3000	3	each	\$ 36	\$ 108		\$ -	\$ 108
NPS 1, Union, 304 SS, 3000#	4	each	\$ 100	\$ 400		\$ -	\$ 400
NPS 1, Flange, 304SS, CL. 150, RFSSO		each	\$ 20	\$ -		\$ -	\$ -
NPS 1, studs and nuts, gasket		lot		\$ -	\$ 84	\$ -	\$ -
NPS 1-1/2, Type 304 Stainless Pipe, Sch 40S	8	m	\$ 66	\$ 531		\$ -	\$ 531
NPS 1-1/2, 90° Elbow, 304 SS, 3000#	1	each	\$ 68	\$ 68		\$ -	\$ 68
NPS 1-1/2, Tee, 304 SS, 3000	1	each	\$ 70	\$ 70		\$ -	\$ 70
NPS 1-1/2, 45° Elbow, 304 SS, 3000#	2	each	\$ 49	\$ 98		\$ -	\$ 98
NPS 1-1/2, Flange, 304SS, CL. 150, RFSSO	6	each	\$ 29	\$ 174		\$ -	\$ 174
NPS 1-1/2, studs and nuts, gasket	6	lot		\$ -	\$ 84	\$ 502	\$ 502
NPS 3, Type 304 Stainless Pipe, Sch 40S	112	m	\$ 108	\$ 12,158		\$ -	\$ 12,158
NPS 3, 90° Elbow, 304 SS	33	each	\$ 51	\$ 1,683		\$ -	\$ 1,683
NPS 3, Tee, 304 SS	6	each	\$ 84	\$ 504		\$ -	\$ 504
NPS 3, 45° Elbow, 304 SS	1	each	\$ 34	\$ 34		\$ -	\$ 34
NPS 3, Flange, 304SS, CL. 150, RFSSO	20	each	\$ 26	\$ 520		\$ -	\$ 520
NPS 1-1/2 x 3, Reducer, 304 SS		each		\$ -		\$ -	\$ -
NPS 3, studs and nuts, gasket & bolt-ups	20	lot		\$ -	\$ 98	\$ 1,963	\$ 1,963
NPS 6, Type 304 Stainless Pipe, Sch 40S	6	m	\$ 269	\$ 1,614		\$ -	\$ 1,614
NPS 6, 90° Elbow, 304 SS	2	each	\$ 290	\$ 580		\$ -	\$ 580
NPS 6, Flange, 304SS, CL. 150, RFSSO	1	each	\$ 26	\$ 26		\$ -	\$ 26
Shop Handling Pipe for Fabrication - NPS 3, SS Sch 40	112	m	\$ -	\$ -	\$ 15	\$ 1,679	\$ 1,679
Shop Handling Pipe for Fabrication - NPS 6, SS Sch 40	6	m	\$ -	\$ -	\$ 15	\$ 90	\$ 90
Shop Welds - Manual Butt Welds - NPS 3, SS Sch 40	60	each	\$ -	\$ -	\$ 219	\$ 13,144	\$ 13,144
Shop Welds - Manual Butt Welds - NPS 6, SS Sch 40	9	each	\$ -	\$ -	\$ 363	\$ 3,267	\$ 3,267
Attaching Flanges - NPS 1-1/2, Flange, 304SS, CL. 150, RF	5	each	\$ -	\$ -	\$ 109	\$ 547	\$ 547
Attaching Flanges - NPS 3, Flange, 304SS, CL. 150, RF	30	each	\$ -	\$ -	\$ 213	\$ 6,384	\$ 6,384
Attaching Flanges - NPS 6, Flange, 304SS, CL. 150, RF	1	each	\$ -	\$ -	\$ 363	\$ 363	\$ 363
Field Handling & Running Small Bore Pipe - NPS 1, SS Sch	58	m	\$ -	\$ -	\$ 61	\$ 3,480	\$ 3,480
Field Handling & Running Small Bore Pipe - NPS 1-1/2, SS	8	m	\$ -	\$ -	\$ 68	\$ 548	\$ 548
Field Handling & Erecting Fabricated Spool Pieces - NPS 3,	149	m	\$ -	\$ -	\$ 84	\$ 12,480	\$ 12,480
Field Handling & Erecting Fabricated Spool Pieces - NPS 6,	6	m	\$ -	\$ -	\$ 102	\$ 613	\$ 613
Field Welds - Pipe - NPS 1, Sch. 40, SW	30	ea	\$ -	\$ -	\$ 85	\$ 2,551	\$ 2,551
Field Welds - Pipe - NPS 1-1/2, Sch. 40, SW	15	ea	\$ -	\$ -	\$ 109	\$ 1,640	\$ 1,640
Field Welds - Pipe - NPS 3, 304 SS, Sch 40, Butt Weld	20	ea	\$ -	\$ -	\$ 163	\$ 3,255	\$ 3,255
NPS 1, Field Handling Valves		each	\$ -	\$ -	\$ 33	\$ -	\$ -
NPS 1-1/2, Field Handling Valves		each	\$ -	\$ -	\$ 33	\$ -	\$ -
NPS 3, Field Handling Valves	10	each	\$ -	\$ -	\$ 99	\$ 988	\$ 988
Olets	1	ls	\$ 500	\$ 500	\$ 1,500	\$ 1,500	\$ 2,000
Vents & Drains	1	ls	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 5,000



MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Water treatment (in)
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	KAC	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DISCIPLINE:	Mech-Process
		DATE:	May 14, 2019

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
PVC & PP Pipe and Fittings							
NPS 1/2, PP Pipe, SDR11 c/w hanger every 4.0 m		m	\$ 72.90	\$ -	\$ 17.94	\$ -	\$ -
NPS 1/2, PP Coupling, SDR11, Socket Fusion		each	\$ 1.43	\$ -	\$ 8.34	\$ -	\$ -
NPS 1/2, PP 90° Elbow, Socket Fusion		each	\$ 1.53	\$ -	\$ 8.34	\$ -	\$ -
NPS 1/2, PP 45° Elbow, Socket Fusion		each	\$ 1.53	\$ -	\$ 8.34	\$ -	\$ -
NPS 1/2, PP Tee, Socket Fusion		each	\$ 2.82	\$ -	\$ 13.29	\$ -	\$ -
NPS 1-1/2, PVC Pipe, Sch. 40 c/w hanger every 3.05 m	10	m	\$ 18.70	\$ 187	\$ 30.11	\$ 301	\$ 488
NPS 1-1/2, PVC Coupling, Socket Joint	8	each	\$ 3.15	\$ 25	\$ 17.30	\$ 138	\$ 164
NPS 1-1/2, PVC 90° Elbow, Socket Joint	6	each	\$ 5.10	\$ 31	\$ 17.30	\$ 104	\$ 134
NPS 1-1/2, PVC 45° Elbow, Socket Joint		each	\$ 7.00	\$ -	\$ 17.30	\$ -	\$ -
NPS 1-1/2, PVC Tee, Socket Joint	1	each	\$ 6.75	\$ 7	\$ 25.96	\$ 26	\$ 33
NPS 2, PVC Pipe, Sch. 40 c/w hanger every 3.05 m	6	m	\$ 25.26	\$ 152	\$ 30.11	\$ 181	\$ 332
NPS 2, PVC Coupling, Socket Joint	1	each	\$ 4.70	\$ 5	\$ 17.30	\$ 17	\$ 22
NPS 2, PVC 90° Elbow, Socket Joint	1	each	\$ 7.85	\$ 8	\$ 17.30	\$ 17	\$ 25
NPS 2, PVC 45° Elbow, Socket Joint		each	\$ 9.15	\$ -	\$ 17.30	\$ -	\$ -
NPS 2, PVC Tee, Socket Joint		each	\$ 9.55	\$ -	\$ 25.96	\$ -	\$ -
NPS 3, PVC Pipe, Sch. 40 c/w hanger every 3.05 m	4	m	\$ 50.75	\$ 223	\$ 30.11	\$ 132	\$ 356
NPS 3, PVC Coupling, Socket Joint	2	each	\$ 15.90	\$ 32	\$ 17.30	\$ 35	\$ 66
NPS 3, PVC 90° Elbow, Socket Joint	1	each	\$ 27.80	\$ 28	\$ 17.30	\$ 17	\$ 45
NPS 3, PVC 45° Elbow, Socket Joint		each	\$ 36.16	\$ -	\$ 17.30	\$ -	\$ -
NPS 3, PVC Tee, Socket Joint		each	\$ 40.65	\$ -	\$ 25.96	\$ -	\$ -
NPS 4, PVC Pipe, Sch. 40 c/w hanger every 3.05 m	25	m	\$ 72.90	\$ 1,823	\$ 40.04	\$ 1,001	\$ 2,824
NPS 4, PVC Coupling, Socket Joint	1	each	\$ 22.95	\$ 23	\$ 33.99	\$ 34	\$ 57
NPS 4, PVC 90° Elbow, Socket Joint	5	each	\$ 49.60	\$ 248	\$ 33.99	\$ 170	\$ 418
NPS 4, PVC 45° Elbow, Socket Joint		each	\$ 65.00	\$ -	\$ 33.99	\$ -	\$ -
NPS 4, PVC Tee, Socket Joint	1	each	\$ 74.00	\$ 74	\$ 50.99	\$ 51	\$ 125



MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Water treatment (in)
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	KAC	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DATE:	May 14, 2019

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
Equipment							
Supply and Install Demineralized Water Tank	1	each	\$ 40,000	\$ 40,000	\$ 2,471	\$ 2,471	\$ 42,471
Supply and Install Oil Water Separator	1	each	\$ 26,000	\$ 26,000	\$ 19,765	\$ 19,765	\$ 45,765
Re-install Exist. Demin Transfer Pumps, pipe (to TP) and	30	hrs	\$ -	\$ -	\$ 70	\$ 2,100	\$ 2,100
Re-install Exist. Resin Tanks (2 total), pipe (to TP) and	30	hrs	\$ -	\$ -	\$ 70	\$ 2,100	\$ 2,100
Re-Install Exist. Water Softeners (2 Total)	5	hrs	\$ -	\$ -	\$ 70	\$ 350	\$ 350
Re-Install Exist. Emergency Shower/Eyewash Station	1	each	\$ -	\$ -	\$ 70	\$ 70	\$ 70
Re-install CIP Tanks, pipe (to TP) and valves	20	hrs	\$ -	\$ -	\$ 70	\$ 1,400	\$ 1,400
Re-Install Exist. RO Skids	100	hrs	\$ -	\$ -	\$ 70	\$ 7,000	\$ 7,000
Pump stand	3	each	\$ 250	\$ 750	\$ 206	\$ 618	\$ 1,368
MonoRails (3 Total)	0	lot	\$ -	\$ -	\$ 5,000	\$ -	\$ -
Pipe Supports		each	\$ -	\$ -	\$ -	\$ -	\$ -
Small Trapeeze / Post	15	each	\$ 250	\$ 3,750	\$ 1,000	\$ 15,000	\$ 18,750
Medium Trapeeze	15	each	\$ 500	\$ 7,500	\$ 1,500	\$ 22,500	\$ 30,000
Large Trapeeze	6	each	\$ 750	\$ 4,500	\$ 2,500	\$ 15,000	\$ 19,500
Rental Equipment (Boom truck, generators, etc.)		LS			\$ 10,000	\$ -	\$ -
Pickling & Flushing	1	LS	\$ -	\$ -	\$ 25,000	\$ 25,000	\$ 25,000
Hydro-Testing	1	LS	\$ -	\$ -	\$ 1,500	\$ 1,500	\$ 1,500
Commissioning	1	LS	\$ -	\$ -	\$ 5,000	\$ 5,000	\$ 5,000
			\$ -	\$ -	\$ -	\$ -	\$ -

SUB-TOTAL					\$110,116.97	\$184,589.95	\$294,706.92
Labour Adjustment Factors							
Working at Heights	0 to 4.4 m	LS			10%	\$18,459.00	\$18,459.00
Multi-Story Bldg.	Floors 1 & 2	LS			0%	\$0.00	\$0.00
congested area factor	Warehouse	LS			15%	\$27,688.49	\$27,688.49
Contingencies							
Design Development Contingency		LS			0%	\$0.00	\$0.00

SUB-TOTAL - A					\$110,116.97	\$230,737.44	\$340,854.41
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Contractor OH&P				15%	\$16,517.55		\$16,517.55
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SUB-TOTAL - B							\$357,371.96
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Construction Contingency - C					0%		\$0.00
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Water Treatment inside TOTAL (A + B + C)							\$358,000.00
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MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Instrument air
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	KAC	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DISCIPLINE:	Mech-Process
		DATE:	May 30, 2019

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
Stainless Steel Pipe and Fittings							
NPS 1/2, Type 304 Stainless Pipe, Sch 40S		m	\$ 23	\$ -	\$ -	\$ -	\$ -
NPS 1/2, 90° Elbow, 304 SS, 3000#		each	\$ 15	\$ -	\$ -	\$ -	\$ -
NPS 1/2, Tee, 304 SS, 3000#		each	\$ 16	\$ -	\$ -	\$ -	\$ -
NPS 3/4, Type 304 Stainless Pipe, Sch 40S	20	m	\$ 30	\$ 591	\$ -	\$ -	\$ 591
NPS 3/4, 90° Elbow, 304 SS, 3000#	29	each	\$ 23	\$ 667	\$ -	\$ -	\$ 667
NPS 3/4, Tee, 304 SS, 3000#	8	each	\$ 26	\$ 208	\$ -	\$ -	\$ 208
NPS 1, Type 304 Stainless Pipe, Sch 40S	124	m	\$ 39	\$ 4,882	\$ -	\$ -	\$ 4,882
NPS 1, 90° Elbow, 304 SS, 3000#	9	each	\$ 29	\$ 261	\$ -	\$ -	\$ 261
NPS 1, Tee, 304 SS, 3000#	2	each	\$ 36	\$ 72	\$ -	\$ -	\$ 72
Handling & Erecting Straught Run Pipe - NPS 1/2	0	m		\$ -	\$ 64	\$ -	\$ -
Handling & Erecting Straught Run Pipe - NPS 3/4	20	m		\$ -	\$ 68	\$ 1,353	\$ 1,353
Handling & Erecting Straught Run Pipe - NPS 1	124	m		\$ -	\$ 71	\$ 8,829	\$ 8,829
Thread Pipe (incl. cut) - NPS 1/2 to NPS 2	72	ea		\$ -	\$ 34	\$ 2,455	\$ 2,455
NPS 1/2, Field Handling Valves		each		\$ -	\$ 16	\$ -	\$ -
NPS 3/4, Valves, Quick Connects, etc.	8	each	\$ 100	\$ 800	\$ 150	\$ 1,200	\$ 2,000
NPS 1, Valves, Quick Connects, etc.		each	\$ 150	\$ -	\$ 250	\$ -	\$ -
Equipment							
Re-install Exist. Air Compressors	20	hrs		\$ -	\$ 70	\$ 1,400	\$ 1,400
Re-install Exist. Air Receivers	20	hrs		\$ -	\$ 70	\$ 1,400	\$ 1,400
Re-install Exist. Air Dryers	20	hrs		\$ -	\$ 70	\$ 1,400	\$ 1,400
Pipe Supports (inc.)	10	each	\$ 250	\$ 2,500	\$ 500	\$ 5,000	\$ 7,500
Hydro-Testing	1	LS		\$ -	\$ 500	\$ 500	\$ 500
Commissioning	1	LS		\$ -	\$ 2,000	\$ 2,000	\$ 2,000

SUB-TOTAL					\$9,980.44		\$25,536.81	\$35,517.25
Labour Adjustment Factors								
Working at Heights	0 to 4.4 m	LS				10%	\$2,553.68	\$2,553.68
Multi-Story Bldg.	Floors 1 & 2	LS				0%	\$0.00	\$0.00
congested area factor	Warehouse	LS				15%	\$3,830.52	\$3,830.52
Contingencies								
Design Development Contingency		LS				0%	\$0.00	\$0.00

SUB-TOTAL - A					\$9,980.44		\$31,921.01	\$41,901.45
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Contractor OH&P				15%	\$1,497.07			\$1,497.07
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SUB-TOTAL - B								\$43,398.52
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Construction Contingency - C						0%		\$0.00
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Instrument air TOTAL (A + B + C)								\$44,000.00
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MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Water treatment (out)
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	KAC	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DISCIPLINE:	Mech-Process
		DATE:	May 14, 2019

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
Stainless Steel Pipe and Fittings							
NPS 1, Type 304 Stainless Pipe, Sch 40S	78	m	\$ 39	\$ 3,071	\$ -	\$ -	\$ 3,071
NPS 1, 90° Elbow, 304 SS, 3000#	10	each	\$ 40	\$ 400	\$ -	\$ -	\$ 400
NPS 1, Tee, 304 SS, 3000		each	\$ 36	\$ -	\$ -	\$ -	\$ -
NPS 1, Union, 304 SS, 3000#	4	each	\$ 100	\$ 400	\$ -	\$ -	\$ 400
NPS 1, Flange, 304SS, CL. 150, RFSSO		each	\$ 20	\$ -	\$ -	\$ -	\$ -
NPS 1, studs and nuts, gasket		lot		\$ -	\$ 84	\$ -	\$ -
NPS 1-1/2, Type 304 Stainless Pipe, Sch 40S	86	m	\$ 66	\$ 5,643	\$ -	\$ -	\$ 5,643
NPS 1-1/2, 90° Elbow, 304 SS, 3000#	12	each	\$ 68	\$ 816	\$ -	\$ -	\$ 816
NPS 1-1/2, Tee, 304 SS, 3000		each	\$ 70	\$ -	\$ -	\$ -	\$ -
NPS 1-1/2, 45° Elbow, 304 SS, 3000#		each	\$ 49	\$ -	\$ -	\$ -	\$ -
NPS 1-1/2, Flange, 304SS, CL. 150, RFSSO		each	\$ 29	\$ -	\$ -	\$ -	\$ -
NPS 1-1/2, studs and nuts, gasket		lot		\$ -	\$ 84	\$ -	\$ -
NPS 3, Type 304 Stainless Pipe, Sch 40S	78	m	\$ 108	\$ 8,445	\$ -	\$ -	\$ 8,445
NPS 3, 90° Elbow, 304 SS	10	each	\$ 51	\$ 510	\$ -	\$ -	\$ 510
NPS 3, Tee, 304 SS		each	\$ 84	\$ -	\$ -	\$ -	\$ -
NPS 3, 45° Elbow, 304 SS		each	\$ 34	\$ -	\$ -	\$ -	\$ -
NPS 3, Flange, 304SS, CL. 150, RFWN		each	\$ 26	\$ -	\$ -	\$ -	\$ -
NPS 1-1/2 x 3, Reducer, 304 SS		each		\$ -	\$ -	\$ -	\$ -
NPS 3, studs and nuts, gasket & bolt-ups		lot		\$ -	\$ 98	\$ -	\$ -
Shop Handling Pipe for Fabrication - NPS 1-1/2, SS Sch 40	86	m		\$ -	\$ 12	\$ 1,072	\$ 1,072
Shop Handling Pipe for Fabrication - NPS 3, SS Sch 40	78	m		\$ -	\$ 15	\$ 1,166	\$ 1,166
Shop Welds - Socketweld - NPS 1-1/2, SS Sch 40	0	each		\$ -	\$ 121	\$ -	\$ -
Shop Welds - Manual Butt Welds - NPS 3, SS Sch 40	0	each		\$ -	\$ 219	\$ -	\$ -
Attaching Flanges - NPS 1-1/2, Flange, 304SS, CL. 150, RF	0	each		\$ -	\$ 109	\$ -	\$ -
Attaching Flanges - NPS 3, Flange, 304SS, CL. 150, RF	0	each		\$ -	\$ 213	\$ -	\$ -
Attaching Flanges - NPS 6, Flange, 304SS, CL. 150, RF	0	each		\$ -	\$ 363	\$ -	\$ -
Field Handling & Erecting Fabricated Spool Pieces - NPS 1,	78	m		\$ -	\$ 61	\$ 4,721	\$ 4,721
Field Handling & Erecting Fabricated Spool Pieces - NPS 1-	86	m		\$ -	\$ 68	\$ 5,817	\$ 5,817
Field Handling & Erecting Fabricated Spool Pieces - NPS 3,	78	m		\$ -	\$ 84	\$ 6,542	\$ 6,542
Field Welds - Pipe - NPS 1, Sch. 40, SW	23	ea		\$ -	\$ 85	\$ 1,956	\$ 1,956
Field Welds - Pipe - NPS 1-1/2, Sch. 40, SW	26	ea		\$ -	\$ 109	\$ 2,879	\$ 2,879
Field Welds - Pipe - NPS 3, 304 SS, Sch 40, Butt Weld	23	ea		\$ -	\$ 163	\$ 3,743	\$ 3,743
				\$ -		\$ -	\$ -
Olets	1	ls	\$ 500	\$ 500	\$ 1,500	\$ 1,500	\$ 2,000
Vents & Drains	1	ls	\$ 2,500	\$ 2,500	\$ 2,500	\$ 2,500	\$ 5,000
PVC & PP Pipe and Fittings							
NPS 1-1/2, PVC Pipe, Sch. 40 c/w hanger every 3.05 m	78	m	\$ 18.70	\$ 1,459	\$ 30.11	\$ 2,349	\$ 3,807
NPS 1-1/2, PVC Coupling, Socket Joint	15	each	\$ 3.15	\$ 47	\$ 17.30	\$ 260	\$ 307
NPS 1-1/2, PVC 90° Elbow, Socket Joint	10	each	\$ 5.10	\$ 51	\$ 17.30	\$ 173	\$ 224
NPS 1-1/2, PVC 45° Elbow, Socket Joint		each	\$ 7.00	\$ -	\$ 17.30	\$ -	\$ -
NPS 1-1/2, PVC Tee, Socket Joint		each	\$ 6.75	\$ -	\$ 25.96	\$ -	\$ -
Insulation & Cladding (1" Pipe - 1" thick)	88	m	\$ 22	\$ 1,957	\$ 15	\$ 1,299	\$ 3,256
Insulation & Cladding (1-1/2" Pipe - 1" thick)	96	m	\$ 24	\$ 2,324	\$ 15	\$ 1,464	\$ 3,788
Insulation & Cladding (3" Pipe - 1-1/2" thick)	88	m	\$ 39	\$ 3,412	\$ 18	\$ 1,616	\$ 5,028
Pipe Supports	10	each	\$ 250	\$ 2,500	\$ 247	\$ 2,471	\$ 4,971
Misc. Supports	1	LS		\$ -	\$ 1,000	\$ 1,000	\$ 1,000
Pickling & Cleaning	1	LS		\$ -	\$ 12,000	\$ 12,000	\$ 12,000
Hydro-Testing	1	LS		\$ -	\$ 1,000	\$ 1,000	\$ 1,000
Commissioning	1	LS		\$ -			\$ -
SUB-TOTAL				\$34,034.22		\$55,526.28	\$89,560.50



MECHANICAL / PROCESS PROBABLE COST ESTIMATE SHEET

PROJ. NAME:	MECL - Turbine Services Relocation	SHEET:	Water treatment (out)
PROJ. NUMBER:	192616.00	CLIENT:	MECL
PREPARED BY:	KAC	CHECKED BY:	KP
		EST. TYPE:	Class 1
		DISCIPLINE:	Mech-Process
		DATE:	May 14, 2019

DESCRIPTION	QTY.	UNIT	MATERIAL COST		LABOUR COST		TOTAL
			\$/UNIT	\$	\$/UNIT	\$	\$
Mechanical Labour Rate		hrs		\$0	\$70	\$0	\$0
Contractor Markup on Materials			1.0	\$0		\$0	\$0
Productivity Factor on Labour				\$0	85%	\$0	\$0
Labour Adjustment Factors							
Working at Heights	0 to 4.4 m	LS				\$0.00	\$0.00
Multi-Story Bldg.	Floors 1 & 2	LS			0%	\$0.00	\$0.00
congested area factor	Warehouse	LS			0%	\$0.00	\$0.00
Contingencies							
Design Development Contingency		LS			0%	\$0.00	\$0.00

SUB-TOTAL - A				\$34,034.22		\$55,526.28	\$89,560.50
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Contractor OH&P			15%	\$5,105.13			\$5,105.13
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SUB-TOTAL - B							\$94,665.64
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Construction Contingency - C					0%		\$0.00
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Water Treatment outside TOTAL (A + B + C)							\$95,000.00
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APPENDIX C

Updated Cost Estimate, April 8, 2021



April 8, 2021

Mr. Kent Nicholson
Manager, Production and Energy Control Operations
Maritime Electric Company Limited
180 Kent Street, P.O. Box 1328
Charlottetown, PE, C1A 7N2

Dear Mr. Nicholson:

*RE: MECL Turbine Plant Building Updated Probable Cost
Inflation and Escalation Adjustments from 2019 to 2021*

1.0 Scope of Work

Maritime Electric Company Limited (MECL) requested that CBCL Limited (CBCL) provide an updated 2021 AACE Class 1 estimate as part of the scope of work for the new CT3 equipment building and relocation of the associated equipment. CBCL previously developed design drawings and specifications to a stage to allow the completion of this probable cost.

2.0 Probable Cost Development

This opinion of probable costs is presented on the basis of experience, qualifications, and best judgement. It has been prepared in accordance with acceptable principles and practices. Market trend changes; non-competitive bidding situations; unforeseen labour and material adjustments, availability and the like are beyond the control of CBCL and as such cannot warrant or guarantee that actual costs will not vary from the opinion provided.

The revised estimate uses the same quantities from the previous 2019 estimate. This revision is to update the cost for material and labour and current market conditions.

3.0 Cost Considerations

All costs are on the basis of competitive bids; a minimum of 5 general contractors and major subcontractors for each trade being received in 2021 based on a CCDC contract format.

There are a number of tangible and intangible factors associated with increasing upward pressure on probable construction costs. The major reasons are below:

- .1 Based on discussions with major industrial subcontractors, labour rates for electrical and mechanical trades persons has increased in last 2 years approximately 7% to \$75.00 per hour including overhead and profit; and may exceed this rate given availability of Red Seal trades people.
- .2 The other Construction Labour Management Bureau trade agreements are in the general range of 2% per annum. However, Industry leaders noted in order to retain skilled labour 3% is often the norm.

- .3 A productivity factor for all trades is assumed to be 70% as this project is expected to be complex in the required sequencing; requiring extended or overtime hours to complete. This has changed from an 85% productivity factor used for the estimate in 2019. The prime contractors performing own forces work and major subcontractors confirmed this is the factor at this time for this type of project. The PF has been lowering over time because of aging work force, scarcity of tradespeople, and site supervisors.
- .4 Build Force Canada is the economic body that tracks and forecasts construction economic data in the Maritime construction industry. It has a ranking system based on the human resource availability of 33 trades. It analyses the number of active members, upcoming retirements, and apprentices moving up thru the labour force. The meaning of the rankings are described below and range from #1 to #5. The rankings specific to this project in 2021 for skilled trades are ranked from #2 to #4. The construction management trades were ranked #4, the building trades ranked #3, and the civil excavation operating engineers trades ranked #2.

.5

Table 1: Build Force Canada Table¹

1	Workers meeting employer qualifications are available in local market to meet demand		
2	Workers meeting employer qualifications are available in local market to meet increased demand		
3	Workers meeting employer qualifications limited in local market, need to compete to attract workers		
4	Workers meeting employer qualifications in local market are generally not available		
5	Needed workers meeting employer are not available project & production maybe delayed		
No.	Trades	Budget Element	Rating
1	Construction Managers	A	4
2	Carpenters	A	3
3	Heavy Eq. Operators	D1	2
4	Crane Operators	D1	2
5	Labouers	A , D1	3
6	Concrete Finishers	A	3
7	Rebar	A	3
8	Iron Wokers	A	3
9	Crane Operators	A	3
10	Roofers	A	3
11	Industrial Plumbers,	C1	3
12	Pipe Fitters, Millrights	C1A	3
13	Sheet Metal Workers	C1	3
14	Industrial Insulators	C1	3
15	Industrial Electricians	C2	3

¹ Source: Build Force Canada/CANS

4.0 Elemental Budget Items

A Building Shell +25%

The labour component of this element is ranked #3 which includes the steel frame, iron workers, steel wall and roof siding, carpenters, form workers, are all in limited supply locally.

The material components of this element have had unusual large price spikes in the last 4-5 months, and corresponding long deliveries.

The labour component was increased by 3% per annum x 2 years; and material increased 3% x 1 year; and steel costs 45% x 1 year (refer to Figure 1 and Figure 2).

Figures 1 and 2, and Table 2 have been included to provide current data showing significant increases in construction materials in recent months.

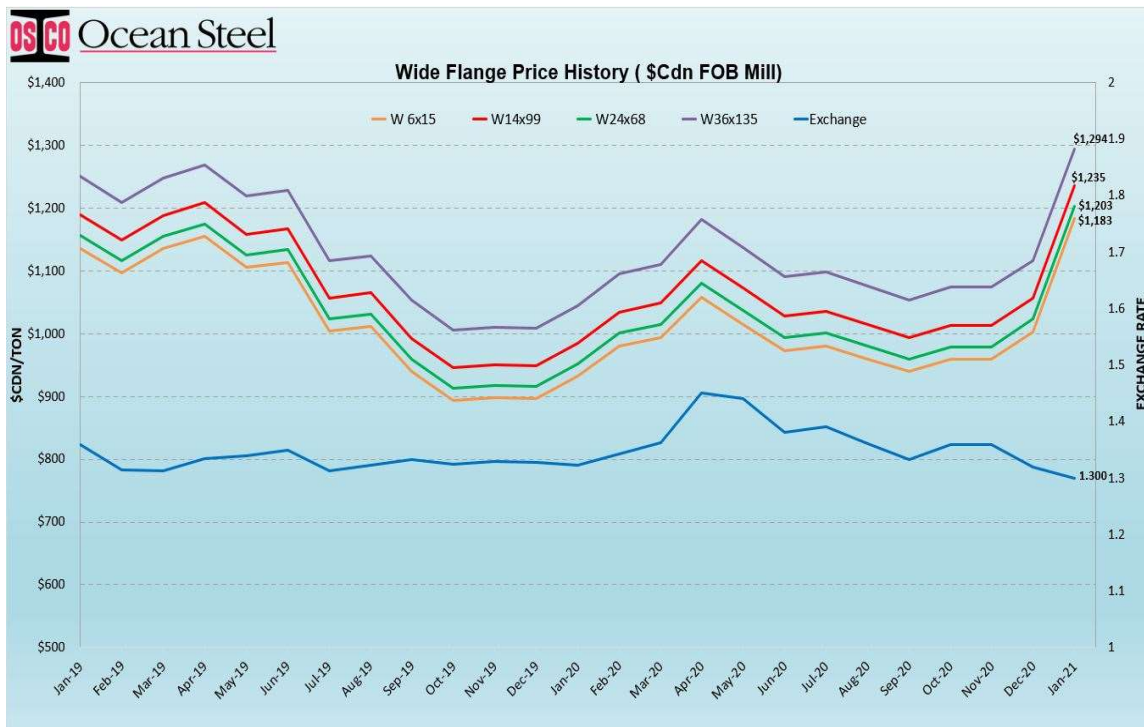


Figure 1: WF Price History Ocean Steel Mill Prices

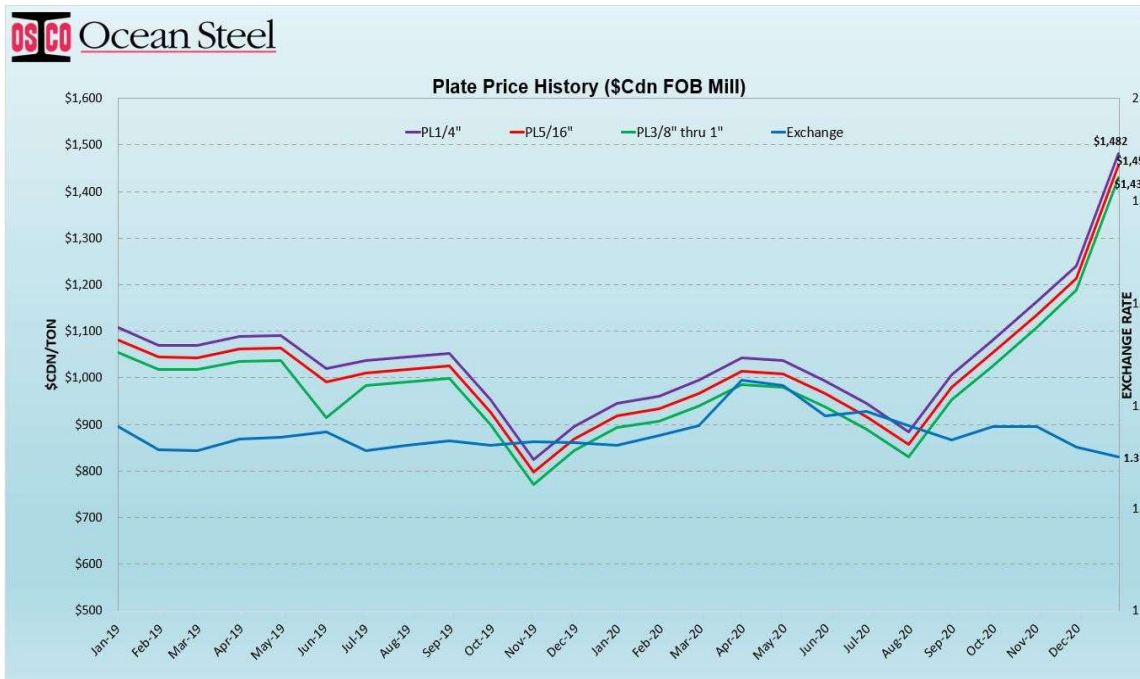


Figure 2: Steel Plate Ocean Steel Mill Prices

Table 2: Producer Price Index²

Associated Builders & Contractors Producer Price Index March 2021			
No.	Inputs to Construction	1 Month (% Change)	12 Month (% Change)
1	Plumbing Fixtures/Fittings	04%	1.3%
2	Fab. Struct Mtl. Products	2.1%	6.2%
3	Iron & Steel	.04	22.0%
4	Steel Mill Products	11.8%	20.0%
5	Nonferrous Wire & Cable	2.4%	13.2%
6	Softwood Lumber	8%	79.7%
7	Concrete Products	0.04%	1.8%
8	Asphalt, Roofing, Flashing	-2%	3.7%
9	Crude Petroleum	8.6%	13.4%
10	Natural Gas	14.5%	76.2%
11	Unprocessed Energy Mat.	9.8%	28.7%

B Interiors + 5.1%

The labour and material components of this element are ranked #2 and are available to meet employer demands.

A 2.5% per annum increase x 2 years was applied.

² Source: Bureau of Labour Statistics 1Q 2021

Mr. Kent Nicholson

April 8, 2021

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C1 Mechanical – Building + 10.3%

The labour and material escalation for this subtrade were combined for this increase.

A 5% per annum increase x 2 years was applied.

C1A Mechanical – Process + 17.4%

The basis for cost increases are as follows:

- 20% - Stainless steel increase
- 30% - PVC costs (Expected to further escalate due to US production issues)
- 20% - Steel costs
- 15% - RS Means construction industry database change in overall costs
- 7% - Labour increase from \$70/hr to \$75/hr
- Reduction of productivity factor from 85% to 70%

C2 Electrical complete with Instrumentation & Controls + 13.5%

The basis for cost increases are as follows:

- 13.5% - 750kVA Generator
- 11.1% - 600V,60A, 3ph Panel (LP-01/02, DP-01B)
- 4.1% - 120/208V, 225A, 3ph Panel (DP-02)
- 5.6% - 120/208V, 100A, 1ph Panel (DP-02)
- 79.3% - Cable Tray (24"wide)
- 25.4% - Cable Tray (90deg elbow) (24")
- 94.6% - Cable Tray Tee Section (24")
- 32% - Teck Connectors
- 3.6% - 15A 125V Duplex Receptacle
- 6.7% - 15/20A Duplex Receptacle
- 2.5% - 15A 125V GFCI Duplex Receptacle
- 2.3% - 15/20A 125V GFCI Duplex Receptacle
- 7% - Labour increase from \$70/hr to \$75/hr
- Productivity Factor change from 85% to 70%

D1 Sitework + 6%

The labour and material escalation for this subtrade were combined for this increase.

A 3% per annum increase x 2 years was applied.

D2 Ancillary Work – Equipment Relocation + 6%

The labour and material escalation for this subtrade were combined for this increase.

A 3% per annum increase x 2 years was applied.

Z1 General Requirements and Contractor Fees + 12.4%

The labour component of this element are ranked #4 which includes the supervisory, procurement, safety, and project manager personnel, who are not available locally. It also requires travelling, room and board, and labour burdens and living allowances as much of the trades will travel into the project.

Mr. Kent Nicholson

April 8, 2021

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Bonding and All Risk Insurance premiums increases related to increase in project value.

Discussions with General Contractors has confirmed the market opportunities are continuing to increase. Their bidding strategies are based on the number of competitors, contract format, schedule, complexity, payment history and other potential economic opportunities.

A 6% per annum increase x 2 years was applied.

We trust this meets with your approval. Please note there is no guarantee that pre-tender estimates will precisely match bid prices, just as there is no expectation that all bid prices will be the same.

Yours very truly,

CBCL Limited



Prepared by:

Archie Thibault, PQS (F)

Senior Quantity Surveyor

Direct: (902) 492-7971

E-Mail: archiet@cbcl.ca



Reviewed by:

Randy O'Connor, P.Eng.

Manager, Electrical and Instrumentation

Attachment: Revised Estimate

Project No: 192616.04

This document was prepared for the party indicated herein. The material and information in the document reflects CBCL Limited's opinion and best judgment based on the information available at the time of preparation. Any use of this document or reliance on its content by third parties is the responsibility of the third party. CBCL Limited accepts no responsibility for any damages suffered as a result of third-party use of this document.

ATTACHMENT 1

Revised Estimate



**OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation**

Class 1 - Elemental Format Construction & Design Budget

DATE:	May 30, 2019
CBCL No:	192616.00
PREPARED BY:	GA/PS/MP/KP/AT
BUDGET:	Class 1

DATE:	March 26, 2021
CBCL No:	192616.04
PREPARED BY:	CBCL
BUDGET:	Class 1

No.	DESCRIPTION	GFA m ²	Cost / m ²	2019		2021		
				Budget Amount	% of Total	Budget Amount	\$ Increase	% Increase
A	BUILDING SHELL	331	\$ 2,163	\$ 716,000	17%	\$896,000	\$180,000	25.1%
B	INTERIORS	331	\$ 393	\$ 130,000	3%	\$136,600	\$6,600	5.1%
C1	MECHANICAL - BUILDING	331	\$ 254	\$ 84,000	2%	\$92,610	\$8,610	10.3%
C1A	MECHANICAL - PROCESS	331	\$ 1,698	\$ 562,000	13%	\$660,000	\$98,000	17.4%
C2	ELECTRICAL c/w INSTRUMENTATION & CONTROLS	331	\$ 2,632	\$ 871,000	21%	\$990,695	\$119,695	13.7%
D1	SITWORK	331	\$ 1,051	\$ 348,000	8%	\$369,300	\$21,300	6.1%
D2	ANCILLARY WORK - EQUIPMENT RELOCATIONS	331	\$ 89	\$ 29,465	1%	\$31,259	\$1,794	6.1%
Z1	GENERAL REQUIREMENTS AND CONTRACTORS FEES	331	\$ 1,242	\$ 411,000	10%	\$461,800	\$50,800	12.4%
Z24	DESIGN DEVELOPMENT CONTINGENCY - Note 1	331	\$ -	\$ -	0%	\$0	\$0	0%
	ESCALATION (Based on 2019 Can. Dollars)	331	\$ -	Not Included	0%	Based on 2021 Dollars	\$0	
TOTAL CONSTRUCTION AMOUNT without Contingency, Design Fees or Owner Costs		331	\$ 9,521	\$ 3,151,000	74.7%	\$3,638,000	\$487,000	15%
Z23	CONSTRUCTION CONTINGENCY - C.O.'s - Note 2	331	\$ 952	\$ 315,000	7.5%	\$363,800	\$48,800	15%
Z21	DESIGN FEES & DISBURSEMENTS	331	\$ 2,275	\$ 753,000	17.8%	\$775,759	\$22,759	3%
	TEMPORARY SWING SPACE	331	\$ -	Not Applicable	0.0%	Not Applicable	\$0	N/A
	MOVING ALLOWANCE	331	\$ -	Not Applicable	0.0%	Not Applicable	\$0	N/A
TOTAL CONSTRUCTION AMOUNT with Contingency, Design Fees and Owner Costs		331	\$ 12,748	\$ 4,219,000	100%	\$4,778,000	\$559,000	

This opinion of probable costs is presented on the basis of experience, qualifications, and best judgement. It has been prepared in accordance with acceptable principles and practices. Market trend changes; non competitive bidding situations; unforeseen labour and material adjustments, availability and the like are beyond the control of CBCL Limited and as such cannot warrant or guarantee that actual costs will not vary from the opinion provided.

- Note 1** A Design Development Construction Contingency is to allow for necessary, increase in scope costs as the work is better defined
Note 2 A Construction Contingency is for the cost of additional work over and above the original tendered contract amount
Note 3 The Escalation/Inflation is for anticipated increases in construction costs from time of budget & tender call - (Not Included based on 2019 Dollars)



OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation
Class 1 - Elemental Summary

DATE:	March 26, 2021
CBCL No:	192616.04
PREPARED BY:	DC/PS/LP/MP/AT
BUDGET:	Class 1

ELEMENT	GFA	331	m2	Ratio to GFA	Elemental Amount		Rate per Area		%
					Sub-total	Total	Sub-total	Total	
A SHELL						\$ 896,000		\$ 2,707	18.8%
A1 SUBSTRUCTURE						299,503		905	6.3%
A11	Foundations			1.000	\$	299,503		904.95	6.3%
A12	Basement Excavation			0.003	\$	-		0.00	0.0%
A2 STRUCTURE						210,423		636	4.4%
A21	Lowest Floor Construction			1.000	\$	44,450		134.31	0.9%
A22	Upper Floor Construction			0.003	\$	-		0.00	0.0%
A23	Roof Construction			1.000	\$	165,973		501.49	3.5%
A3 EXTERIOR ENCLOSURE						385,143		1164	8.1%
A31	Walls Below Grade			0.000		Not Applicable		0.00	
A32	Walls Above Grade			1.000	\$	302,652		914.47	6.3%
A33	Windows and Entrances			1.000	\$	1,288		3.89	0.0%
A34	Roof Coverings			1.003	\$	81,203		245.36	1.7%
A35	Projections			0.000		Not Applicable		0.00	
B INTERIORS						\$ 136,600		\$ 413	2.9%
B1 PARTITIONS AND DOORS						59,685		180.34	1.2%
B11	Partitions			1.310	\$	39,525		119.43	0.8%
B12	Doors			1.000	\$	20,160		60.91	0.4%
B2 INTERIOR FINISHES						37,971		114.73	0.8%
B21	Floor Finishes			1.000	\$	27,492		83.07	0.6%
B22	Ceiling Finishes			0.038	\$	1,015		3.07	0.0%
B23	Wall Finishes			2.620	\$	9,464		28.60	0.2%
B3 FITTINGS AND EQUIPMENT						38,913		117.58	0.8%
B31	Fittings and Fixtures			1.000	\$	38,913		117.58	0.8%
B32	Equipment			1.000	\$	-		0.00	0.0%
B33	Conveying Systems			1.000	\$	-		0.00	0.0%
C SERVICES						\$ 1,742,000		\$ 5,263	36.5%
C1 MECHANICAL - BUILDING						91,600		276.77	1.9%
C11	Plumbing and Drainage			1.000	\$	27,244		82.32	0.6%
C12	Fire Protection			1.000	\$	33,187		100.28	0.7%
C13	HVAC			1.000	\$	31,160		94.15	0.7%
C1A MECHANICAL - PROCESS						660,000		1994.20	13.8%
C15	Water Treatment (Inside)				\$	366,564			
C16	Water Treatment (Outside)				\$	111,530			
C16	Compressed Air				\$	48,134			
C18	Water Treatment System Removal				\$	70,440			
C18	Oil Water Separator				\$	53,728			
C19	Compressed Air System Removal				\$	9,392			
C2 ELECTRICAL c/w INSTRUMENTATION & CONTROLS						989,700		2990.39	20.7%
C21	Electrical Disconnects & Demolition			1.000	\$	23,972		72.43	0.5%
C22	Relocate Existing Equipment			1.000	\$	11,611		35.08	0.2%
C23	Systems and Ancillaries			1.000	\$	802,042		2423.38	16.8%
C19	Instrumentation and Controls				\$	152,012		459.31	3.2%
NET BUILDING SUBTOTAL - LESS SITE						2,772,938		\$ 8,378	58.0%



OPINION of PROBABLE CONSTRUCTION COST
MECL CT3 BOP Turbine Equipment Relocation
Class 1 - Elemental Summary

DATE:	March 26, 2021
CBCL No:	192616.04
PREPARED BY:	DC/PS/LP/MP/AT
BUDGET:	Class 1

ELEMENT GFA 331 m2	Ratio to GFA	Elemental Amount		Rate per Area		%
		Sub-total	Total	Sub-total	Total	
A SHELL			\$ 896,000		\$ 2,707	18.8%
D SITE & ANCILLARY WORK			\$ 399,800		\$ 1,208	8.4%
D1 SITEWORK			368,500		1113.43	7.7%
D11 Site Development	1.000	\$	139,898		422.70	2.9%
D12 Mechanical Site Services	1.000	\$	100,311		303.09	2.1%
D13 Electrical Site Services	1.000	\$	128,212		387.40	2.7%
D2 ANCILLARY WORK - EQUIPMENT RELOCATIONS			31,300		94.57	0.7%
D21 Equipment Relocations	1.000	\$	31,262		94.46	0.7%
D22 Alterations	0.003		Not Applicable			
NET BUILDING SUBTOTAL - INCLUDING SITE			3,172,738		\$ 9,586	66.4%
Z GENERAL REQUIREMENTS AND ALLOWANCES			\$ 1,601,600		\$ 4,839	33.5%
Z1 GENERAL REQUIREMENTS AND CONTRACTORS FEES			461,600		1394.73	9.7%
Z11 General Requirements and Overheads	1.000	\$	153,851		464.86	3.2%
Z12 Contractors Profit	1.000	\$	307,702		929.72	6.4%
Z2 ALLOWANCES			1,140,000		3444.53	23.9%
Z21 Design Fees and Disbursements	1.000	\$	775,759		2343.97	16.2%
Z22 Escalation Allowance	1.000		Not Included		0.00	
Z23 CONSTRUCTION CONTINGENCY - C.O.'s - Note 2		\$	363,800			7.6%
Z24 Design Development Construction Contingent	1.000	\$	-		0.00	0.0%
TOTAL CONSTRUCTION COST (Less HST)			\$ 4,778,000		\$ 14,437	100.0%