City of Saint John

Contract Specifications

TENDER NO. 2022-085302T
LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

City of Saint John

CONTRACT SPECIFICATIONS

FOR

TENDER NO. 2022-085302T
LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

OCTOBER 2022

City of Saint John

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DIVISION 1 – PROJECT DESCRIPTION

PROJECT DESCRIPTION

1.1 GENERAL DESCRIPTION

The work consists generally of supplying all labour, materials, and equipment to complete Lancaster Lagoon Blower upgrade and DO Control as per the Specifications and Drawings.

1.2 CONTRACT DOCUMENTS

a) General Specifications, City of Saint John, New Brunswick, with all applicable Divisions as listed in the Table of Contents of the Contract Specifications.

b) Contract Specifications,
Tender No.: 2022-085302T
Contract: LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL
City of Saint John, New Brunswick

c) List of Drawings

Sheet No.	Title
E-1	Electrical Site Plan and Specifications
E-2	Electrical Blower Building Floor Plans and Single Line Diagrams
P01	Dissolved Oxygen Upgrade Site Plan & Details
P02	New Blower Plans, Section and Details
P03	Process Specification Page 1 of 2
P04	Process Specification Page 2 of 2

1.3 AUTHORIZED ENQUIRIES CONTACT

During the procurement phase of this project, all inquiries shall be referred to:

Monic MacVicar, CCLP, CPPB
Procurement Specialist
Supply Chain Management
City of Saint John
175 Rothesay Avenue, Saint John, NB
supplychainmanagement@saintjohn.ca

City of Saint John

CONTRACT SPECIFICATIONS

DIVISION 2

INSTRUCTIONS TO TENDERERS AND TENDERING PROCEDURES

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INSTRUCTIONS TO TENDERERS AND TENDERING PROCEDURES

2.1 TRADE TREATIES AND TENDERING POLICY

2.1.01 Internal Trade Agreements

Tenderers should note that the within procurement is subject to trade agreements including the Canadian Free Trade Agreement and the Atlantic Procurement Agreement and the Agreement on Opening Public Procurement for Quebec and NB.

2.1.02 Tendering Policy

Tenderers should note that the within Procurement shall conform with The City of Saint John "Tendering Policy for Construction Contracts" which is attached hereto as Appendix "A".

2.2 MATERIAL DISCLOSURES

2.2.01 General

The City makes the following material disclosures with respect to this Request for Tender. While the City has used considerable efforts to ensure the accurate representation of all information in this Request for Tender, including these material disclosures, such information is supplied solely as a guideline for Tenderers. The City does not warrant or guarantee the accuracy of such information, nor is such information necessarily comprehensive or exhaustive. Nothing in this Request for Tender is intended to relieve Tenderers of the obligation to form their own opinions and reach their own conclusions with respect to the matters addressed in this Request for Tender.

2.2.02 Permits Required for Project

Except as stated otherwise in the Tender Document, any and all permits and approvals required by the Authorities having jurisdiction, and arrangements for all inspections of the Work by these Authorities shall be obtained and paid for by the Contractor. The cost of such approvals, permits and inspection shall be included in the Tender Price.

2.2.03 Deemed Examination and Acceptance

Tenderers should note that by submission of a Tender they will be deemed to have examined and accepted the Specifications and Drawings, visited the site, and informed themselves as to existing conditions and limitations.

2.2.04 Availability of Services

The Tenderer shall ascertain from the relevant Authorities the availability of services, including, but not limited to, electricity, sewer, water, telephone, natural gas and transportation to the project and shall ascertain what prior notice each Authority will require for the installation of the service to the project.

2.2 MATERIAL DISCLOSURES (Cont'd)

2.2.05 Tax

a) Tenderers are advised to make special note of all applicable tax procedures.

b) The City is required to pay the Harmonized Sales Tax (HST).

c) The total tendered amount shall include the appropriate taxes on all labour, material and equipment to be incorporated into the Work.

d) Tenderers shall submit their Tenders on the basis that the total amount of the Tender shall include all taxes for which the City is liable.

e) Any increase or decrease in costs to the Tenderer due to the changes in such taxes and duties, after the date of the Tender Closing, shall increase or decrease the value of the Contract accordingly.

2.2.06 Performance Guarantees Required Prior to Contract Execution

Within five (5) Working Days following the City's notice of selection, the selected Tenderer shall provide the City with the required Performance Guarantees being a Performance Bond and a Labour and Material Payment Bond, each at fifty percent (50%) of the Tender Price covering the faithful performance of the full Contract. The bonds shall be in favour of *The City of Saint John* and show *The City of Saint John* as obligee; Unless specified elsewhere within the tender documents, the Performance Bond and the Labour and Material Payment Bond shall be in the form prescribed by regulation pursuant to the *Construction Remedies Act*. The Performance Bond and the Labour and Material Payment Bond shall be issued and be compliant with the requirements of the *Construction Remedies Act* whether the value of the Contract is less than the amount of prescribed pursuant to section 83(1) and 83(2) and 84(1) of the *Construction Remedies Act*.

2.2.07 Insurance

Tenders should refer to Division 6 (section 6.8) for details regarding insurance requirements.

2.2 MATERIAL DISCLOSURES (Cont'd)

2.2.08 WorkSafeNB Certificate and Business Corporations Act Certificate

a) New Brunswick Tenderers shall provide to the City a WorkSafeNB certificate which confirms proper registration and good standing with WorkSafeNB and a *Business Corporations Act* Certificate which confirms proper registration with the Province of New Brunswick - Corporate Affairs (of which the Contractor must be in good standing) within five (5) Working Days following the City's notice of selection.

b) Out-of-province Tenderers shall provide to the City a WorkSafeNB certificate which confirms proper registration and good standing with WorkSafeNB or a letter or certificate issued under the equivalent applicable legislation in the province of origin of the Tenderer confirming extension of coverage from said legislation to the Province of New Brunswick for the term of the Contract. Subject to paragraph c), out-of-province Tenderers shall also provide a *Business Corporations Act* Certificate which confirms proper registration with the Province of New Brunswick - Corporate Affairs (of which the Contractor must be in good standing) within five (5) Working Days following the City's notice of selection.

c) Tenderers from Nova Scotia may submit the appropriate *Business Corporations Act* Certificate from the Province of Nova Scotia.

2.2.09 New Brunswick Construction Safety Association

If the total Tender Price for the work, inclusive of HST, is two hundred and fifty thousand dollars ($250,000.00) or more, Tenderers shall supply a Letter of Good Standing under the Certificate of Recognition Program from the New Brunswick Construction Safety Association. Out-of-Province Tenderers shall supply an equivalent from the Tenderer's Province of origin acceptable to the Engineer.

2.2.10 Timetable for Completion of the Work

The Substantial Completion of the Work is to be determined.

2.3 SCHEDULE FOR THE TENDER PROCESS

Issue Date of Request for Tender	Tuesday, October 25th, 2022
Job Site Meeting	Thursday, October 27th, 2022 at 10:00:00 AM Local Time
Deadline for Enquiries	Monday, October 31st, 2022 at 4:00:00 PM Local Time
Deadline for Issuing Addenda	Tuesday, November 1st, 2022 at 4:00:00 PM Local Time
Tender Closing	**Tuesday, November 8th, 2022 at 2:30:00 PM Local Time**

The Schedule for the Tender Process is tentative only and may be changed by the City in its sole discretion at any time prior to Tender Closing.

2.4 TENDER DOCUMENTS

2.4.01 Tender Documents to be Obtained in Prescribed Manner

Tender Documents shall be obtained from the City of Saint John, 175 Rothesay Avenue, 1st Floor, Saint John, New Brunswick. In order to obtain the Tender Documents the following requirements must be met:

a) deposit a non-refundable payment for each set of Tender Documents in an amount specified in the tender advertisement; and

b) the Tenderer must register on the City's official list of bidders for this project, as follows:

   (i) registration of the full legal name, contact person, telephone number and email address of the Tenderer obtaining the Tender Documents; or, if applicable,

   (ii) the registration of the full legal name, contact person, telephone number and email address of the Tenderer on whose behalf the Tender Documents are being obtained.

The names of the Tenderers having complied with the above criteria will be consolidated onto the City's official bidders list. Only Tenderers listed on the City's official bidders list shall be entitled to submit a Tender. Any Tender received from a Tenderer who has not obtained the Tender Documents from the City of Saint John and is not registered on the City's official list of bidders for this project in the manner set out above will not be evaluated.

The City will post the official list of bidders for all projects, updated on Tuesdays and Thursdays during the tendering period on the City of Saint John website www.saintjohn.ca under the Tenders & Proposals link.

2.5 COMMUNICATIONS AFTER ISSUANCE OF TENDER

2.5.01 Tenderers to Review Tender Documents

Tenderers shall promptly examine all Tender Documents and:

a) shall report any errors, omissions or ambiguities; and

b) may direct enquiries or seek additional information

in writing by email before the Deadline for Enquiries to the Authorized Enquiries Contact or the Designated Alternate Contact (in the event of absence) as set out below. No such communications are to be directed to anyone other than the Authorized Enquiries Contact or the Designated Alternate Contact.

Authorized Enquiries Contact	**Designated Alternate Contact**
Monic MacVicar, CCLP, CPPB Procurement Specialist Supply Chain Management City of Saint John Email: supplychainmanagement@saintjohn.ca	Chris Roberts, SCMP, CPPB Manger Supply Chain Management City of Saint John Email: supplychainmanagement@saintjohn.ca

It is the Tenderer's responsibility to seek clarification from the City on any matter it considers unclear. The City shall not be responsible for any misunderstanding on the part of the Tenderer concerning this Tender or its process.

The City intends to confirm receipt of a Tenderer's communication by way of an email in reply. If a Tenderer has not received a reply, the Tenderer may wish to resend its communication as the lack of reply may have resulted from a technical problem. The City is under no obligation to respond to enquiries or provide additional information but may do so at its sole discretion.

2.5 COMMUNICATIONS AFTER ISSUANCE OF TENDER (Cont'd)

2.5.02 Email Communication

The following provisions shall apply to any communications with the Authorized Enquiry Contact or the Designated Alternate Contact by email where such email communication or delivery is permitted by the terms of this Tender:

a) The City does not assume any risk or responsibility or liability whatsoever to any Tenderer:

(i) for ensuring that any email system being operated for the City is in good working order, able to receive transmissions, or is not engaged in receiving other transmissions such that a Tenderer's transmission cannot be received;

(ii) if a permitted email communication or delivery is not received by the City, or is received in less than its entirety, within any time limit specified by this Tender; and

(iii) for any error that may occur in the submission of communications or enquiries.

b) All permitted communications submitted by a Tenderer by email to the Authorized Enquiries Contact or the Designated Alternate Contact shall be deemed to have been received on the dates and times indicated on the Authorized Enquiry Contact's or the Designated Alternate Contact's email system

2.5.03 Addenda: Responses to Enquiries and Amendments or Clarifications to Tender Documents

The City may, in its sole and absolute discretion, through the Authorized Enquiry Contact or the Designated Alternate Contact, respond to enquiries and/or amend the Tender Documents before Tender Closing.

Written Addenda are the only means of responding to enquiries or amending the Tender Documents. Only the Authorized Enquiry Contact or the Designated Alternate Contact, and no other employee or agent of the City, is authorized to respond to enquiries and amend the Tender Documents by issuing an Addendum.

Responses to enquiries, changes, clarifications or corrections prepared and circulated by the City form part of the Tender Documents and will be issued as Addenda. Responses will be made in writing and distributed by email to all Tenderers who are registered on the City's official bidders list in accordance with the procedure outlined in section 2.4.01 b) above, as of the date the response is prepared by the City. Each Addendum will contain a signature page(s) which each Tenderer is required to sign and include with its Tender submission. While the City will make reasonable efforts to deliver each Addendum to all Tenderers, it makes no guarantee of timely delivery of any Addendum to any Tenderer.

2.5.03 Addenda: Responses to Enquiries and Amendments or Clarifications to Tender Documents (Cont'd)

The City will not identify the source of the question in the response. If a Tenderer requests that an enquiry be treated as confidential, the City, in its sole discretion, will either treat the enquiry or any reply as confidential or inform the Tenderer that it will not respond to the enquiry unless the Tenderer withdraws in writing its request that the enquiry be treated as confidential.

Orally communicated information shall not be binding upon the City. Information offered from sources other than the Authorized Enquiry Contact or the Designated Alternate Contact with regard to the content, intent or interpretation of this Tender is not official, may be inaccurate and should not be relied on in any way, by any Tenderer, for any purpose.

2.6 SUBMISSION OF TENDER

2.6.01 Location of Tender Box for the Submission of Tender

City of Saint John
175 Rothesay Avenue, 1st Floor
Saint John, New Brunswick

2.6.02 Tenders Must be Submitted Only in the Prescribed Manner

a) Tenders must be submitted in the prescribed *Form of Tender* together with the prescribed *Schedule of Quantities and Unit Prices*. The *Form of Tender* and the *Schedule of Quantities and Unit Prices* shall be filled out in ink or typewritten and bear the signature in longhand.

b) Tenderers must submit one completely filled out original *Form of Tender* signed by an authorized representative and should include the following information written on the outside of the sealed envelope:

(i) Tender No.: ***2022-085302T***

(ii) Title of Work: ***Lancaster Lagoon Blower Upgrade and DO Control***

(iii) The full legal name and return address of the Tenderer; and

(iv) Tender Closing date and time.

c) Each Tender shall be accompanied by a Tender (Bid) Bond or certified cheque in the amount of $_____---($_____.00) or ten percent (10%) of the Tender Price.

d) Each Tender must be sealed and be addressed to the attention of the Purchasing Agent, City of Saint John, 1st Floor, 175 Rothesay Avenue, Saint John, New Brunswick E2J 2B4.

e) All Tenders shall include a surety consent letter or agreement to bond as per the requirements in the Form of Tender.

2.6 SUBMISSION OF TENDER (Cont'd)

2.6.03 Contingency Allowance

The Tender Price shall include the contingency allowance as specified in the *Schedule of Quantities and Unit Prices*, to cover additional costs that may occur during the execution of the Contract attributed to approved additional work not originally contemplated. No part of this allowance shall be expended without the written direction of the Engineer, and any part not so expended shall be deducted from the contingency allowance.

2.6.04 Tenders Must be Placed in the Tender Box Before Tender Closing

It is the responsibility of each Tenderer to ensure that its Tender is placed in the Tender Box before Tender Closing. Tenders submitted by fax or by any other electronic transmission will not be considered.

Tenders submitted after Tender Closing will be deemed late, Disqualified and returned to the Tenderer unopened. For the purpose of calculating time, the City clock at the location of the Tender Box shall govern.

The City is not responsible for any Tender that has not been placed in the Tender Box by the Tenderer. The City assumes no responsibility for improperly addressed or delivered Tenders, Tenders that are left outside of the Tender Box, or sent by electronic transmission.

2.6.05 Amending or Withdrawing Tender Prior to Tender Closing

At any time prior to Tender Closing, a Tenderer may amend or withdraw a submitted Tender by placing an amending letter signed by the person who signed the Tender in a sealed envelope in the Tender Box before the Tender Closing.

The amending letter should clearly specify that the Tenderer intends to withdraw its Tender or, in the case of an amendment, clearly indicate the part of the Tender that the amending letter is intending to replace. In the case of a unit price contract, the amending letter shall show the revision to the Tender Price. In the case of a lump sum contract, the amending letter shall state the amount to be added or subtracted from the Tender Price.

The sealed envelope should clearly state the full legal name of the Tenderer, as well as the Tender No., Title of Work, and Tender Closing date and time as stated in section 2.6.02 b).

Amending letters that are left outside of the Tender Box, or sent by mail, by facsimile, electronically, or by other means will not be considered.

2.6.06 Tenderers Shall Bear the Costs of Preparing and Submitting a Tender

Under no circumstances will the City be responsible for a Tenderer's costs of preparing or submitting a Tender.

2.6 SUBMISSION OF TENDER (Cont'd)

2.6.07 Tenders in English

All Tenders are to be in English only. Any Tenders that are not entirely in the English language may be disqualified.

2.6.08 Tender Acceptance Period

Tenders submitted before Tender Closing shall remain open to acceptance in the form submitted by the Tenderer for a period of sixty (60) calendar days after Tender Closing. Failure of the Tenderer to keep the Tender open for sixty (60) calendar days will result in the enforcement of the Tender (Bid) Bond or the cashing of the certified cheque submitted in lieu of the Tender (Bid) Bond pursuant to section 2.6.02 c).

2.6.09 Tender Documents Incorporated Into Tender

By submission of a Tender, a Tenderer is deemed to have accepted and incorporated all the instructions and terms and conditions contained in the Tender Documents into its Tender. Submission of a Tender shall also confirm that the Tenderer is satisfied as to the correctness and sufficiency of the Tender, the Tender Price and the prices entered in the *Schedule of Quantities and Unit Prices*.

2.7 AMENDMENT OR WITHDRAWAL OF TENDER POST TENDER CLOSING

2.7.01 No Amendment Post Tender Closing

No Tenderer is permitted to amend or withdraw its Tender after Tender Closing. A Tenderer who discovers an error in the Tender after Tender Closing may leave the Tender as is or request permission from Common Council to withdraw its Tender. A request to withdraw a Tender after Tender Closing must be delivered, along with the reasons for the request, to the City Clerk for consideration by Common Council within twenty-four (24) hours of Tender Closing.

2.7.02 Withdrawal Requests

Common Council, in its sole discretion, will decide whether or not to grant the withdrawal request based on the information supplied by the Tenderer and a recommendation from City staff. Where Common Council, in its sole discretion, decides to not allow the withdrawal, Common Council may require the Tenderer to perform the Contract or forfeit the Tender (Bid) Bond or the certified cheque submitted in lieu thereof pursuant to section 2.6.02 c).

2.8 TENDER EVALUATION PROCESS

2.8.01 Delivery of Tender Box to Tender Opening Room

Immediately following Tender Closing, the Purchasing Agent shall deliver the Tender Box to the tender opening room where it will be publicly opened by the Tender Opening Committee.

2.8.02 Tender Opening Process

All Tenders shall be removed from Tender Box, opened, evaluated pursuant to Section 2.8.03, then read and recorded by the Tender Opening Committee in public at the Tender Opening Location. The Tender Opening Committee shall open each Tender individually. Tenders submitted by Tenderers who are not registered on the City's official bidders list according to the procedure outlined in section 2.4.01 b) will not be evaluated. The Tender Opening Committee will conduct the evaluation of the Tenders in two stages.

2.8.03 Stage 1: Evaluation of Mandatory Requirements

Stage 1 will consist of a review to determine which Tenders comply with all of the mandatory requirements. Tenders which do not comply with all of the mandatory requirements set out below, shall be Disqualified and not evaluated further.

Tenders shall be deemed as not complying with the mandatory requirements where:

a) The Tender is not in a sealed envelope which bears on its face the full legal name and address of the Tenderer, the Tender number, Title of Work and Tender Closing date and time.

b) The Tender is illegible or its pricing terms or conditions cannot be understood by the Tendering Opening Committee.

c) Where it is a Tender for more than one item and where it is required that all items be bid, there is a failure to bid an item or it does not contain a unit price or extended total of all items to be bid.

d) The Tender contains a bid on an item not included in the *Schedule of Quantities and Unit Prices*.

e) The Tender does not contain the total tender price, the unit prices or the fixed price written in words or does not have the words "dollars" and, where applicable, "cents" set out in the written total tender price, unit prices or fixed price on the *Schedule of Quantities and Unit Prices*.

f) The Tender is not accompanied by the required Tender (Bid) Bond or certified cheque pursuant to section 2.6.02 c).

g) The Tender does not include a fully completed prescribed Form of Tender, signed by an authorized agent, which bears the Tenderer's corporate seal, pursuant to section 2.6.02 a) and Division 4.

2.8.03 Stage 1: Evaluation of Mandatory Requirements (Cont'd)

h) The Tender does not include all required documents specified in the Form of Tender, does not comply with the provisions of the Tender Documents, or does not include the signature page(s) of all addenda issued to the Tenderers signed by the Tenderer.

i) The Form of Tender contains a change in price that is not initialed by the person signing the Form of Tender.

j) The Tender contains an unsolicited alternative or a qualification to the terms of the Tender Documents.

k) Where a Tenderer submits more than one Tender in response to the Request for Tender, all such Tenders shall be Disqualified.

Tenders which are Disqualified by the Tender Opening Committee will be returned to the Tenderer at the address contained in the Tender or in person if the Tenderer is present at the Tender Opening. Tender Prices of Disqualified Tenders will not be announced at the Tender Opening.

2.8.04 Stage 2: Evaluation of Tender Price

Stage 2 will consist of a recording of the Tender Prices by the Tender Opening Committee.

2.8.05 Selection of the Successful Tenderer

At the conclusion of Stage 1 and Stage 2 of the evaluation process and, subject to the approval of selection by Common Council and the reserved rights of the City, the selected Tenderer will enter into the Contract, as set out in the Tender Documents.

2.9 NOTICE OF SELECTION AND EXECUTION OF CONTRACT

2.9.01 Selection of Tenderer

Notice of selection by the City to the selected Tenderer will be in writing. Within five (5) Working Days following the City's notice of selection, the Tenderer shall provide to the City:

a) those items listed at section 6.8.04 ("Insurance Policies and Certificates");

b) an executed Form of Agreement (Division 5); and

c) the required Performance Guarantees pursuant to section 2.2.06

This provision is solely to the benefit of the City and may be waived by the City at its sole discretion.

2.9 NOTICE OF SELECTION AND EXECUTION OF CONTRACT (Cont'd)

2.9.02 Over-Budget Bids

If the Tender Price of the lowest compliant Tender exceeds the City's project budget or the Engineer's estimate for the Project, the City may proceed with negotiations with the lowest compliant Tenderer. Said negotiations shall be conducted within a prescribed timeframe to identify changes in scope and/or quantities of work, in exchange for a corresponding bid price reduction. Where the City and lowest compliant Tenderer establish acceptable changes and a corresponding bid price reduction, those changes shall be documented as post-bid addendum.

Any such negotiations or resulting recommendations shall be conditional and subject to the approval of Common Council and, in accordance with the Limitation of Liability and Waiver set out in section 2.12 below, there shall be no liability resulting from any failure to award a contract.

Where acceptable changes and a corresponding bid price reduction cannot be successfully negotiated with the lowest compliant Tenderer, the City may proceed with a new tender call at a later date.

2.9.03 Failure to Enter Into the Contract

In addition to all of the City's other remedies, such as the enforcement of the Tender (Bid) Bond, if a selected Tenderer fails to execute the Contract, or satisfy any of the applicable conditions set out above at section 2.9.01 within five (5) Working Days of the notice of selection, the City may, in its sole and absolute discretion and without incurring any liability rescind the selection of the Tenderer and proceed with the selection of the next lowest compliant Tenderer.

2.10 CONFIDENTIAL INFORMATION AND MEDIA COMMUNICATIONS

2.10.01 Tenderer's Confidential Commercial Information

The City is committed to an open and transparent Tendering Process while understanding the Tenderers' need for protection of confidential commercial information. To assist the City in meeting this commitment, Tenderers will cooperate and extend all reasonable accommodation to this endeavour.

2.10.02 Tenderer Not to Communicate With Media and Public

To ensure that all public information generated about the Work is fair and accurate, and will not inadvertently or otherwise influence the outcome of the Tendering Process, all public information generated in relation to the Work, including communications with the media and the public, must be coordinated with, and is subject to the prior approval of, the City.

2.10.02 Tenderer Not to Communicate With Media and Public (Cont'd)

Tenderers will notify the City of requests for information or interviews from the media.

Tenderers will ensure that all of the Tenderers' Subcontractors and others associated with the Tenderer comply with the foregoing requirements.

2.11 RESERVED RIGHTS

The City reserves the right to:

a) Reject an unbalanced Tender. For the purpose of this section, an unbalanced tender is a tender containing a unit price which deviates substantially from, or does not fairly represent reasonable and proper compensation for the unit of work bid or one that contains prices which appear to be so unbalanced as to adversely affect the interests of the City. The City reserves the right to use tenders submitted in response to this Request for Tender or for other like or similar work as a guideline in determining if a bid is unbalanced.

b) Amend or modify the scope of the Work, and/or cancel or suspend the Tender award, at any time for any reason;

c) Require Tenderers to provide additional information after the Tender Closing to support or clarify their Tender;

d) Not accept any or all Tenders;

e) Not accept a Tender from a Tenderer who is itself, or whose principals, owners or directors are also principals, owners or directors of another entity which is, involved in litigation, arbitration or any other similar proceeding against the City;

f) Reject any or all Tenders without any obligation, compensation or reimbursement to any Tenderer or any of its team members;

g) Withdraw this Request for Tender and cancel or suspend the Tendering Process;

h) Extend, from time to time, any date, any time period or deadline provided in this Tender (including, without limitation, the Tender Closing), upon written notice to all Tenderers;

i) Assess and reject a Tender on the basis of:

   (i) information provided by references;

   (ii) the Tenderer's past performance on previous contracts;

   (iii) the information provided by a Tenderer pursuant to the City exercising its clarification rights under this Tendering Process;

   (iv) the Tenderer's experience with performing the type and scope of work specified including the Tenderer's experience as a general contractor;

   (v) other relevant information that arises during this Tendering Process

2.11 RESERVED RIGHTS (Cont'd)

j) Waive formalities and accept Tenders which substantially comply with the requirements of this Request for Tender;

k) Verify with any Tenderer or with a third party any information set out in a Tender;

l) Disqualify any Tenderer whose Tender contains misrepresentations or any other inaccurate or misleading information;

m) Disqualify any Tenderer who has engaged in conduct prohibited by the Tender Documents;

n) Disqualify any Tenderer who is guilty of an offence listed in Schedule C of the New Brunswick Regulation 2014-93 under the Procurement Act;

o) Disqualify any Tenderer for documented significant or persistent deficiencies in fulfilling or performing a substantive requirement or obligation under a prior contract or contracts. The disqualification for past performance shall be conducted in accordance with sections 64 thru 81 of the New Brunswick Regulation 2014-93 under the Procurement Act;

p) Make changes, including substantial changes, to the Tender Documents provided that those changes are issued by way of addenda in the manner set out in these Instructions to Tenderers;

q) Select any Tenderer other than the Tenderer whose Tender reflects the lowest cost to the City;

r) Cancel this Tendering Process at any stage, for any reason;

s) Cancel this Tendering Process at any stage and issue a new Request for Tender for the same or similar deliverables;

t) Accept any Tender in whole or in part; or

u) Accept a Tender which contains the following errors:

(i) error in mathematics – whether this involves the extension of a unit price or an error in addition, the mistake will be corrected and the correct total will be used for evaluation purposes and will be binding on the Tenderer.

(ii) conflict between the written and numerical bid prices. In all cases, the total bid price will be corrected to reflect the written bid price, whether lump sum or unit price.

(iii) failure to include the contingency allowance in the total Tender Price. If the contingency allowance was not included in the addition, the Tender Price shall be corrected to reflect its inclusion.

and these reserved rights are in addition to any other express rights or any other rights which may be implied in the circumstances and the City shall not be liable for any expenses, costs, losses or any direct or indirect damages incurred or suffered by any Tenderer or any third party resulting from the City exercising any of its express or implied rights under this Request for Tender.

2.11 RESERVED RIGHTS (Cont'd)

By submitting a Tender, the Tenderer authorizes the collection by the City of the information set out at paragraph 2.11 i) in the manner contemplated in that subparagraph.

2.12 LIMITATION OF LIABILITY AND WAIVER

Each Tenderer, by submitting a Tender, agrees that:

a) Neither the City nor any of its employees, agents, advisors or representatives will be liable, under any circumstances, for any Claim arising out of this Tendering Process including but not limited to costs of preparation of the Tender, loss of profits, loss of opportunity or for any other Claim; and

b) The Tenderer waives any Claim for any compensation of any kind whatsoever, including Claims for cost of preparation of the Tender, loss of profit or loss of opportunity by reason of the City's decision to not accept the Tender submitted by the Tenderer, to award a Contract to any other Tenderer or to cancel this Tendering Process, and the Tenderer shall be deemed to have agreed to waive such right or Claim.

2.13 INVOICES

a) In light of the requirements of Section 169 of the *Excise Tax Act*, R.S.C. 1985,c. E-15, and amendments thereto, the selected Tenderer shall provide to the City properly documented invoices with all requests for payments. This includes a government issued business number and the amount of tax included on the invoice.

b) Failure to provide properly documented invoices may result in delays in processing payments or outright rejection of the payment request.

City of Saint John

APPENDIX 'A'

TENDERING POLICY FOR CONSTRUCTION CONTRACTS

City of Saint John

TENDERING POLICY FOR CONSTRUCTION CONTRACTS

PREAMBLE

Whereas the City of Saint John seeks to duly represent the public interest in the management of its public tendering process for construction contracts;

And whereas taxpayers/ratepayers have the right to expect the benefits of free and open competition, that is, the best goods and services at the lowest possible prices;

And whereas municipal tendering should duly respect the place of other stakeholders, including vendors and contractors, in the process;

And whereas the values of integrity, effectiveness, due process and efficiency must be inherent in the process;

Common Council establishes this tendering policy for construction contracts.

POLICY AND APPLICABLE STATUTES

Persons and/or companies that submit tenders for construction contracts are deemed to have understood and agreed to the requirements of this policy and all applicable tender documentation, as well as all applicable Municipal by-laws and Federal or Provincial statutes. Applicable federal and provincial statutes include, but are not limited to: the *Canada Competition Act*; the *New Brunswick Procurement Act*; *Construction Remedies Act*; *Local Governance Act* and the amendments thereto.

APPLICATION OF POLICY

The City of Saint John seeks to optimize fair, open and independent competition for municipal construction work and to afford interested and qualified contractors the opportunity to seek the business.

This policy has been established for construction contracts valued in excess of $100,000 (before HST). The procedures detailed herein shall apply to all publicly advertised tender calls issued on behalf of the City of Saint John for construction contracts, but do not apply to publicly advertised tenders for the supply of goods and/or services or to invited bids or calls for proposal.

The following divisions of tender specifications for construction contracts form part of this policy: *Instruction to Tenderers and Tendering Procedures* (Division 2); *Form of Tender* (Division 4); and *Form of Agreement* (Division 5).

PUBLIC NOTICE OF TENDER/TENDER ADVERTISEMENT

A public notice of tender shall be issued for all construction contracts valued in excess of one hundred thousand dollars ($100,000). The notice shall state the contract number, a brief description, the date and the time for the closing of tenders, the location of the locked box for receipt of tenders, and the date, time and location of the tender opening.

TENDER DOCUMENTATION

The following documentation shall be provided to those persons or companies who wish to submit a tender, at an appropriate cost as determined by the Chief City Engineer:

1. Division 1: *Project Description* – as determined by the Chief City Engineer or a designate;
2. Division 2: *Instruction to Tenderers and Tendering Procedures* – forming part of this policy;
3. Division 3: *Particular Specifications* - as determined by the Chief City Engineer or a designate;
4. Division 4: *Form of Tender* - forming part of this policy, and including a Certificate of Independent Tender Determination;
5. Division 5: *Form of Agreement* - forming part of this policy;
6. A notice that Division 6: *General Administration of Contract* and Division 7: *Construction of Municipal Services* of the General Specifications apply to all contracts, and that it is the responsibility of the tenderer to familiarize itself with the provisions in Divisions 6 and 7, as well as those of any other division in the General Specifications determined by the Chief City Engineer or a designate to be applicable to the contract; and
7. Applicable contract drawings, as determined by the Chief City Engineer or a designate.

TENDER PROCESSING

Tenders shall be received and processed in accordance with the provisions set out in Division 2: *Instruction to Tenderers and Tendering Procedures*.

TENDER OPENING COMMITTEE

A tender opening committee is hereby established, consisting of a chairman and two members, as follows:

Chair:	*Purchasing Agent or a designate*
Member:	*Chief City Engineer or a designate*
Member:	A member of staff designated by the City Manager

The committee shall proceed in accordance with the provisions set out in Division 2.

TENDER REJECTION AND AWARD OF CONTRACT

The City of Saint John reserves the right to reject any or all tenders, or to accept a tender other than the lowest tender and to accept the tender deemed to be in its best interests, based on evaluation of relevant criteria, including quality, service and price.

Common Council shall make the decision as to whether or not a contract shall be awarded and to whom it will be awarded.

GENERAL SPECIFICATIONS

The Chief City Engineer may, from time to time, revise the technical provisions of the General Specifications to reflect changes in technology, methods or construction industry practices.

City of Saint John

CONTRACT SPECIFICATIONS

DIVISION 3

PARTICULAR SPECIFICATIONS

OCTOBER 2022

City of Saint John

TABLE OF CONTENTS

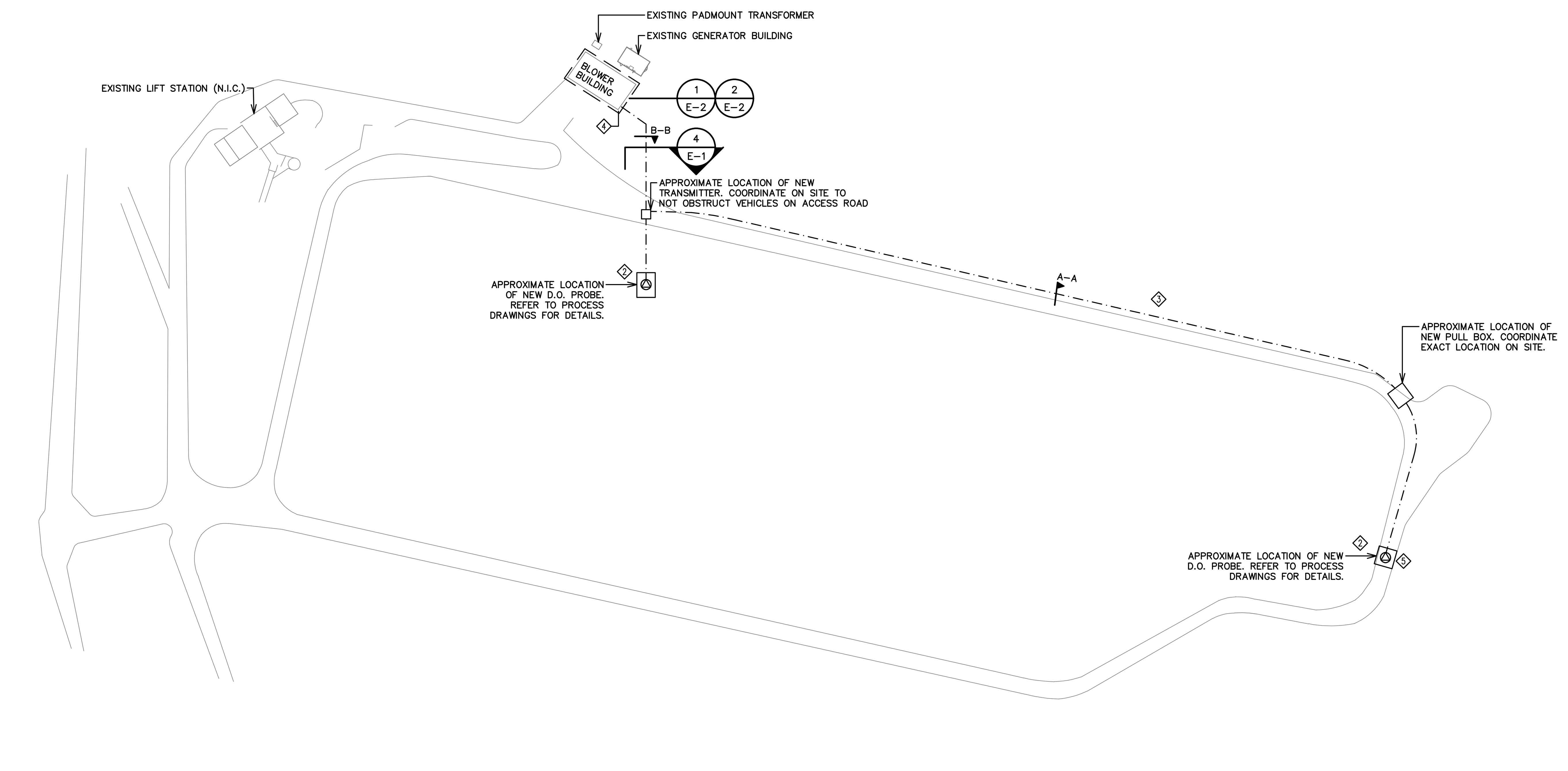
DIVISION 3 – PARTICULAR SPECIFICATIONS

PARTICULAR SPECIFICATIONS

This division shall be read in conjunction with and take precedence where they may prove at variance with the City of Saint John, General Specifications.

3.1 SPECIFICATIONS FOR THIS PROJECT

See Attached

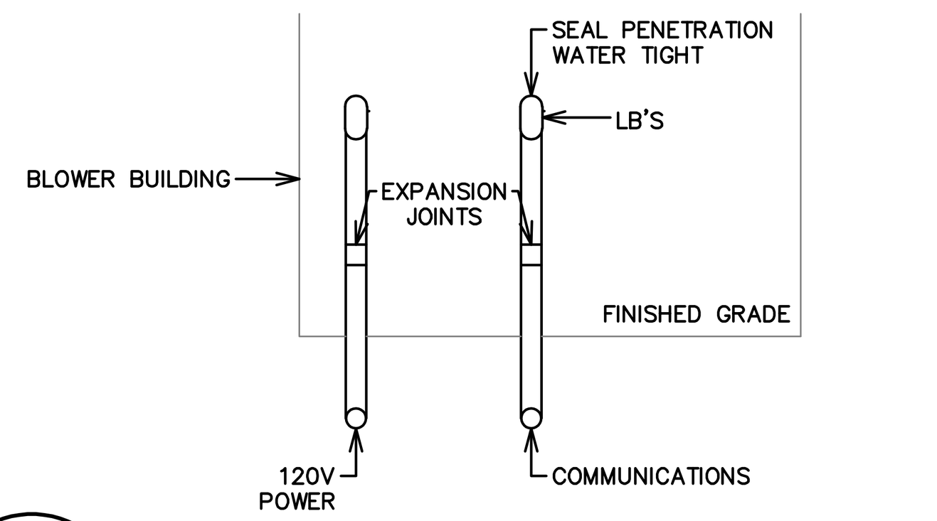


1 E-1 SITE PLAN

SCALE 1:1000

NOTE:

1. CONDUIT ENTERING BUILDING TO BE ROUTED TO PANEL 'PP1' AND PLC/SCADA PANEL.



2 E-1 CONDUIT ELEVATION N.T.S.

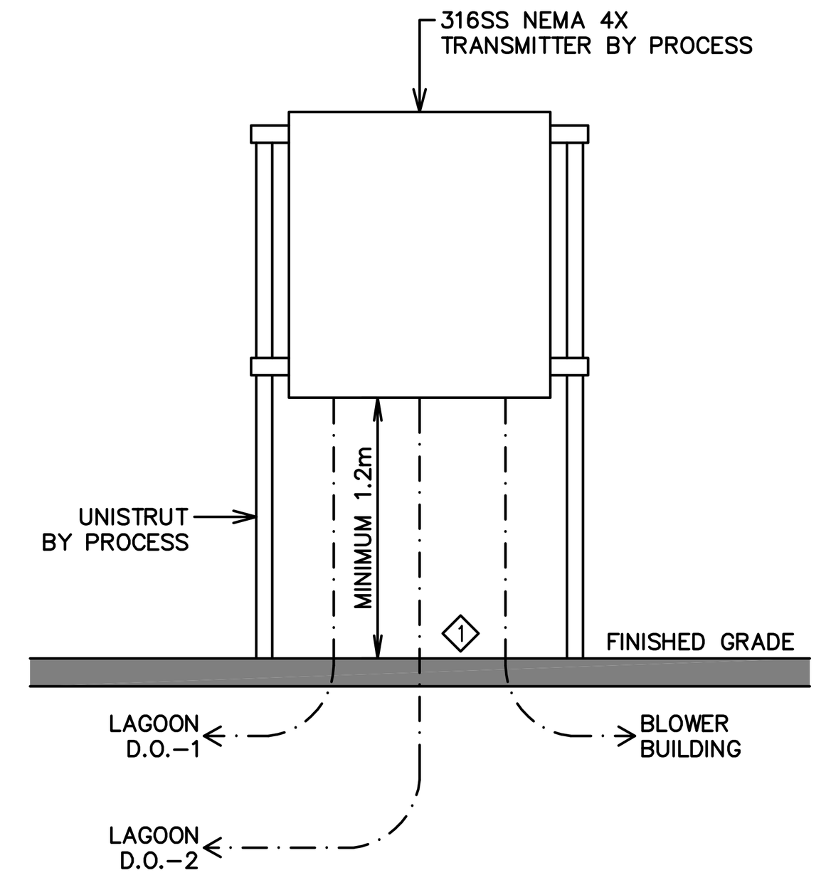
GENERAL NOTES:

1. COORDINATE WITH THE SAINT JOHN WATER OPERATIONS MANAGER ON SITE FOR EXACT EQUIPMENT LOCATION PRIOR TO START OF WORK.
2. ALL TRENCHINGS ARE TO BE COORDINATED WITH ENGLOBE PROJECT ON SITE.

SPECIFIC NOTES:

1. ELECTRICAL CONTRACTOR TO CONVERT FROM PVC UNDERGROUND TO LIQUID TIGHT CONNECTION ABOVE GRADE.
2. PROCESS CONTRACTOR TO SUPPLY AND INSTALL CONTROL WIRE.
3. ELECTRICAL CONTRACTOR TO COORDINATE ON SITE WITH PROCESS CONTRACTOR AND D.O. SUPPLIER TO CONFIRM EXACT LENGTH AND REQUIREMENT FOR CONDUIT.
4. ELECTRICAL CONTRACTOR TO CONVERT FROM PVC OUTSIDE TO EMT INSIDE BUILDING. REFER TO 2/E-1 FOR ELEVATION ON BUILDING EXTERIOR.
5. CONTRACTOR TO CORE DRILL INTO CHAMBER CONTAINING NEW D.O. PROBE. SEAL ALL PENETRATIONS.

3 E-1 NOTES N.T.S.

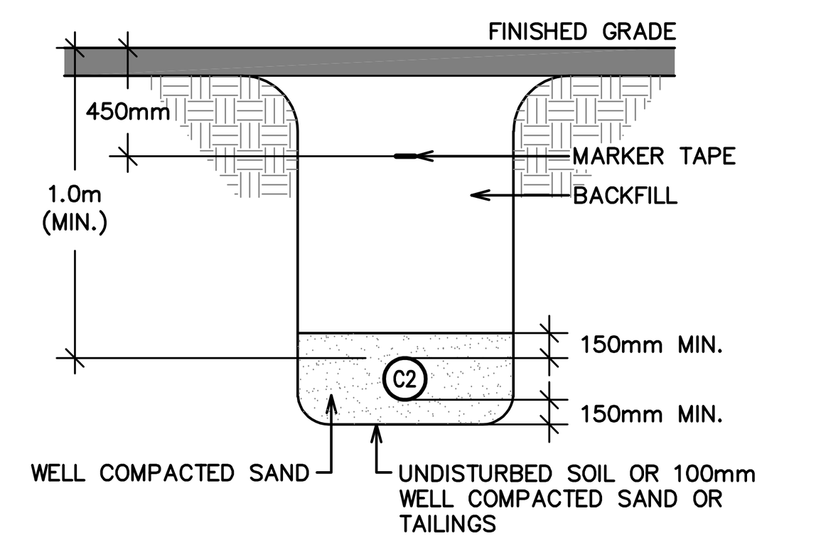


NOTE:

1. JUNCTION BOX TO BE C/W LOCK.

4 E-1 UNISTRUT DETAIL N.T.S.

C2 = 53mm RIGID PVC CONDUIT FOR COMMUNICATIONS



5 E-1 TRENCH DETAIL A-A N.T.S.

1. GENERAL REQUIREMENTS

1.1. THESE ELECTRICAL SPECIFICATIONS SHALL BE READ IN CONJUNCTION WITH: GENERAL REQUIREMENTS, ARCHITECTURAL SPECIFICATIONS, ELECTRICAL DRAWINGS, CITY OF SAINT JOHN SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS.

1.2. SCOPE OF WORK
- 1.2.1. THIS CONTRACTOR SHALL PROVIDE ALL LABOUR, MATERIALS, EQUIPMENT AND SERVICES NECESSARY FOR THE INSTALLATION OF COMPLETELY FINISHED, TESTED, BALANCED AND PROPERLY OPERATING ELECTRICAL SYSTEMS AS SPECIFIED HEREIN AND AS INDICATED ON DRAWINGS. THE INTENT IS TO PROVIDE FOR FINISHED WORK COMPLETE IN ALL ESSENTIALS AS CALLED FOR BY THE CONTRACT DOCUMENTS, IN A MANNER CONSISTENT WITH GOOD WORKMANSHIP.
- 1.2.2. THE WORK INCLUDES, BUT, IS NOT LIMITED TO:
  - 1.2.2.1. WIRING OF EQUIPMENT SUPPLIED BY OTHERS
  - 1.2.2.2. BRANCH CIRCUIT WIRING
  - 1.2.2.3. WIRING DEVICES

1.3. CODES AND STANDARDS
- 1.3.1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH CSA C22.1-21, CANADIAN ELECTRICAL CODE, PART 1. (2021 EDITION) AND THE NATIONAL BUILDING CODE OF CANADA 2015.

1.4. PERMIT AND BY-LAWS
- 1.4.1. OBTAIN PERMITS AND CERTIFICATIONS PRIOR TO START OF WORK. SUBMIT DRAWINGS TO INSPECTION AUTHORITY. COORDINATE SERVICES WITH SAINT JOHN ENERGY. PAY ALL ASSOCIATED FEES.
- 1.4.2. ALL WORK PERFORMED BY THIS CONTRACTOR SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE CODES, LOCAL BY-LAWS, STANDARDS AND THEIR AMENDMENTS.

1.5. SITE VISIT
- 1.5.1. PRIOR TO TENDER CLOSE, THIS CONTRACTOR SHALL COORDINATE WITH SAINT JOHN WATER OPERATIONS MANAGER TO VISIT SITE AND FAMILIARIZE THEMSELVES WITH THE EXISTING SITE CONDITIONS. NO ALLOWANCE SHALL BE MADE FOR PROBLEMS REVISE DUE TO LACK OF KNOWLEDGE OF EXISTING CONDITIONS THAT COULD REASONABLY HAVE BEEN ASCERTAINED BY A CAREFUL INSPECTION.

1.6. COORDINATION OF WORK
- 1.6.1. THIS CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE GENERAL CONTRACTOR AND WITH ALL OTHER SUB-CONTRACTORS.
- 1.6.2. SCHEDULE AND PERFORM ALL WORK IN EXISTING PREMISES WITH PROJECT MANAGER SO AS NOT TO INTERFERE WITH NORMAL OPERATIONS OF BUILDING OCCUPANTS. ANY DISRUPTIVE WORK SHALL BE SCHEDULED OUTSIDE OPERATING HOURS AND AS APPROVED BY OWNER.
- 1.6.3. COOPERATE WITH OTHER TRADES, OWNER AND OWNER'S FORCES IN CARRYING OUT WORK. REPORT ANY DEFICIENCIES OR DEFECTS IN WORK PERFORMED BY OTHERS THAT AFFECT THIS CONTRACT'S WORK TO ENGINEER IMMEDIATELY.
- 1.6.4. WHERE WORK IS CARRIED OUT IN EXISTING PREMISES, NOTIFY CITY OF SAINT JOHN WATER OPERATIONS MANAGER PRIOR TO START OF WORK TO ENSURE WORK DOES NOT INTERFERE WITH THE OPERATORS.

1.7. GUARANTEE
- 1.7.1. THIS CONTRACTOR SHALL PROVIDE, IN WRITING, A GUARANTEE COVERING ALL LABOR AND MATERIAL FOR A PERIOD OF ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION. REPAIR AND MAKE GOOD ALL DEFECTS DURING THE GUARANTEE PERIOD, INCLUDING ANY DAMAGE TO BUILDING INCURRED AS A RESULT OF FAILURE OF ELECTRICAL WORK AND/OR EQUIPMENT INSTALLED.

1.8. DRAWINGS
- 1.8.1. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC ONLY. MAINTAIN ONE SET OF PLANS ON WHICH SHALL BE CLEARLY NOTED ALL CHANGES OR DEVIATIONS FROM THE CONTRACT, AND SUBMIT THEM AT THE END OF THE PROJECT MARKED 'AS-BUILT', SIGNED AND DATED BY THIS CONTRACTOR. THESE DRAWINGS SHALL BE KEPT ON SITE DURING CONSTRUCTION, UPDATED, AND MADE AVAILABLE FOR REVIEW BY ENGINEER, IF REQUESTED.
- 1.8.2. REVIEW PROCESS DRAWINGS AND PROVIDE POWER TO ALL NEW PROCESS EQUIPMENT. CONFIRM EXACT REQUIREMENTS WITH PROCESS CONTRACTOR, REPORT ANY DISCREPANCY TO ENGINEER FOR DIRECTIVE PRIOR TO START OF WORK. COORDINATE AND ASSIST PROCESS CONTRACTOR WITH TESTING OF NEW EQUIPMENT.

1.9. EXTRA WORK
- 1.9.1. NO ALLOWANCE SHALL BE MADE BEYOND CONTRACT PRICE UNLESS CONTRACTOR RECEIVES SIGNED APPROVAL IN ACCORDANCE WITH GENERAL CONDITIONS.

1.10. CUTTING, PATCHING AND FIRESTOPPING
- 1.10.1. ALL CUTTING, PATCHING AND FIRESTOPPING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. THIS CONTRACTOR SHALL LOCATE THE EXACT DIMENSIONS AND POSITIONS OF OPENINGS AND HOLES WHERE CUTTING IS REQUIRED.

1.11. SITE WORK
- 1.11.1. ALL TRENCHING, BACKFILLING AND CONCRETE WORK SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- 1.11.2. ALL UNDERGROUND SERVICES ARE TO BE LOCATED PRIOR TO EXCAVATION. ANY DAMAGE TO SUCH SERVICES SHALL BE THE RESPONSIBILITY OF, AND CORRECTED AT THE EXPENSE OF, THE CONTRACTOR CAUSING DAMAGE.
- 1.11.3. THE CONTRACTOR SHALL NOTIFY AND MAKE THE NECESSARY ARRANGEMENTS WITH THE OWNER AND UTILITY COMPANIES PRIOR TO ANY EXCAVATION.
- 1.11.4. ALL SURFACES SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AFTER EXCAVATION IS COMPLETE.

1.12. SHOP DRAWINGS
- 1.12.1. THIS CONTRACTOR SHALL SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH THE GENERAL REQUIREMENTS. WORK SHALL NOT PROCEED AND EQUIPMENT/MATERIAL SHALL NOT BE ORDERED UNTIL THE SHOP DRAWINGS HAVE BEEN RETURNED STAMPED AND SIGNED. THIS REVIEW DOES NOT RELIEVE THE CONTRACTOR OF THE OBLIGATION OF CHECKING THE DRAWINGS THEMSELVES OR FURNISHING THE MATERIALS SPECIFIED.
- 1.12.2. WHEN SUBMITTED, SHOP DRAWING MUST BEAR CONTRACTOR'S STAMP REPRESENTING THAT THEY HAVE DETERMINED AND VERIFIED ALL FIELD MEASUREMENTS, FIELD CONSTRUCTION CRITERIA, MATERIALS, CATALOGUE NUMBERS AND SIMILAR DATA AND THAT THEY HAVE CHECKED AND COORDINATED EACH SHOP DRAWING WITH REQUIREMENTS OF WORK AS INDICATED ON DRAWINGS AND SPECIFICATIONS.
- 1.12.3. SHOP DRAWINGS REQUIRED FOR: CONTROLS AND BREAKERS. INFORMATION REQUIRED: MANUFACTURER, MODEL, DIMENSIONS, CONSTRUCTION DETAILS, ACCESSORIES, INSTALLATION DETAILS, CAPACITIES, PERFORMANCE DATA, FINISHES. INCLUDE WIRING SINGLE LINE AND SCHEMATIC DIAGRAMS WHERE APPLICABLE.
- 1.12.4. ALL MATERIAL SUPPLIED SHALL BE NEW AND CARRY C.S.A. CERTIFICATION OR OTHER CERTIFICATIONS APPROVED BY LOCAL INSPECTION AUTHORITY.

1.13. CLEANING UP
- 1.13.1. THIS CONTRACTOR SHALL, AT ALL TIMES, KEEP THE SITE NEAT, CLEAN AND FREE FROM ACCUMULATION OF WASTE MATERIALS.

1.14. NAMEPLATES
- 1.14.1. SUPPLY AND INSTALL ENGRAVED 0.125mm THICK PLASTIC LAMACOID NAMEPLATES, WHITE FACE-BLACK CORE, FOR ELECTRICAL EQUIPMENT INCLUDING, BUT NOT LIMITED TO: PANELBOARDS AND PULL BOXES, ATTACH WITH SELF-TAPPING SCREWS IN CONSPICUOUS LOCATIONS. WORDING SHALL INDICATE DEVICE NAME, VOLTAGE, PHASE, AMPERAGE AND POWER SOURCE.

1.15. OPERATION AND MAINTENANCE INSTRUCTIONS
- 1.15.1. THIS CONTRACTOR SHALL INSTRUCT THE SAINT JOHN WATER OPERATIONS MANAGER IN OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND SYSTEMS INSTALLED. ALL SAFETY AND CONTROL FEATURES SHALL BE THOROUGHLY EXPLAINED. THREE COPIES OF OPERATION AND MAINTENANCE INSTRUCTIONS, TOGETHER WITH ALL APPROVED SHOP DRAWINGS AND SPARE PARTS LIST FASTENED IN A BINDER, SHALL BE SUBMITTED TO THE OWNER. MANUALS COMPLETE WITH:
  - -DETAILS OF DESIGN ELEMENTS, CONSTRUCTION FEATURES, COMPONENT FUNCTION AND MAINTENANCE REQUIREMENTS, TO PERMIT EFFECTIVE START-UP, OPERATION, MAINTENANCE, REPAIR, MODIFICATION, EXTENSION AND EXPANSION OF ANY PORTION OR FEATURE OF INSTALLATION.
  - -TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS, DESCRIPTIONS OF ITEMS, AND PARTS LISTS. ADVERTISING OR SALES LITERATURE IS NOT ACCEPTABLE.
  - -WIRING AND SCHEMATIC DIAGRAMS AND PERFORMANCE CURVES.
  - -NAME AND ADDRESS OF LOCAL SUPPLIERS.
  - -COPY OF REVIEWED SHOP DRAWINGS.
  - -COPY OF ALL TEST CERTIFICATES.
  - -COPY OF ALL FINAL NEW AND REVISED PANELBOARDS SCHEDULES.
  - -PROVIDE TWO HARD COPIES AND ELECTRONIC COPY.

1.16. DISPOSALS
- 1.16.1. ADVISE OWNER OF AVAILABILITY OF SURPLUS MATERIAL. TURN OVER ITEMS REQUESTED BY OWNER AND DISPOSE OF REMAINDER IN ACCORDANCE WITH ALL BY LAWS AND LOCAL AUTHORITIES HAVING JURISDICTION.

1.17. DEMOLITION
- 1.17.1. DISCONNECT AND REMOVE ALL DEVICES, COMPONENTS, EQUIPMENT AND EXPOSED RACEWAYS, WIRES AND CABLES, BACK TO SOURCE OF SUPPLY, MADE REDUNDANT BY THIS WORK INCLUDING THOSE WITHIN IN-FLOOR DUCTS AND SUSPENDED CEILINGS. MAKE SAFE ANY REMAINING LIVE CONNECTIONS. LEAVE POLYPROPYLENE PULL CORD IN EACH EMPTY CONDUIT. TAG EACH EMT CONDUIT AT EACH END WITH LOCATION OF OTHER END.
- 1.17.2. ELECTRICAL CONTRACTOR SHALL ENSURE ELECTRICAL CONTINUITY TO EXISTING DEVICES REMAINING.
- 1.17.3. RELOCATE EXISTING WIRING, RACEWAYS, FIXTURES AND DEVICES AS REQUIRED TO MAINTAIN REASONABLE ACCESSIBILITY AND TO FACILITATE INSTALLATION OF TOTAL PROJECT WORK.
- 1.17.4. REVIEW LOADING ON EACH AFFECTED CIRCUIT PRIOR TO START OF CONSTRUCTION AND ADJUST AS REQUIRED.
- 1.17.5. WHERE NEW DRYWALL COVERS EXISTING JUNCTION OR PULL BOXES, INSTALL ACCESS HATCHES.
- 1.17.6. REMOVE CONTAMINATED OR DANGEROUS MATERIALS AS DEFINED BY AUTHORITIES HAVING JURISDICTION RELATING TO ENVIRONMENTAL PROTECTION FROM SITE AND DISPOSE OF IN A SAFE MANNER TO MINIMIZE DANGER AT SITE OR DURING DISPOSAL.

2. BASIC MATERIAL AND METHODS

2.1. EQUIPMENT AND PROPERTY
- 2.1.1. ANY ALTERNATE PRODUCT PROPOSED SHALL MEET SAME STANDARDS AS PRODUCT SPECIFIED BUT SHALL BE CONSIDERED ACCEPTABLE ONLY IF APPROVED PRIOR TO INSTALLATION BY ENGINEER. SUCH APPROVAL WILL NOT BE UNREASONABLY WITHHELD.
- 2.1.2. SPECIFIED PRODUCTS PROVIDED BY THIS CONTRACTOR SHALL BE NEW AND CAPABLE OF PROPER OPERATION. UNSPECIFIED PRODUCTS PROVIDED SHALL BE OF QUALITY BEST SUITED TO THEIR PURPOSE, CSA OR LOCAL INSPECTION AUTHORITY APPROVED AND CAPABLE OF PROPER OPERATION.
- 2.1.3. REUSE EXISTING PRODUCTS WHICH MEET SPECIFICATIONS WHEREVER PRACTICABLE.
- 2.1.4. CLEAN VISIBLE PORTIONS OF ALL DEVICES AND COVER PLATES AS RECOMMENDED BY MANUFACTURER TO RESTORE FACTORY FINISH.
- 2.1.5. PROTECT WORK AND OWNER'S PROPERTY FROM DAMAGE THAT MAY ARISE AS A RESULT OF THIS CONTRACTOR'S PERFORMANCE OF WORK. PROMPTLY MAKE GOOD ANY DAMAGES TO WORK AND OWNER'S PROPERTY ARISING FROM THIS CONTRACTOR'S PERFORMANCE OF WORK.
- 2.1.6. ARRANGE DELIVERIES AND STORAGE WITH OWNER AND AUTHORITIES HAVING JURISDICTION AS APPROPRIATE. PROTECT NEW AND REUSED MATERIALS FROM ABUSE, DAMAGE AND ENVIRONMENTAL CONDITIONS WHICH THEY ARE NOT INTENDED TO WITHSTAND. NOTWITHSTANDING FOREGOING, FOLLOW MANUFACTURER'S RECOMMENDATIONS.
- 2.1.7. ELECTRICAL EQUIPMENT TO BE CERTIFIED BY AN ACCREDITED CERTIFICATION ORGANIZATION AND BEAR THAT ORGANIZATIONS CERTIFICATION MARK AS EVIDENCE OF HAVING CONFORMED TO THE APPROPRIATE CANADIAN STANDARDS ASSOCIATION (CSA) STANDARDS ESTABLISHED UNDER THE PROVISIONS OF THE CANADIAN ELECTRICAL CODE.
- 2.1.8. LOCKOUT AND TAGOUT ALL ELECTRICAL AND OTHER EQUIPMENT BEFORE PERFORMING WORK AS PER CAN/CSA Z460-13.

2.2. WIRING METHODS
- 2.2.1. FOR POWER WIRING, MAINTAIN PHASE SEQUENCE AND COLOR CODING THROUGHOUT. COLOR CODING TO CSA C22.1.
- 2.2.2. LOCATE, DIMENSION AND MAKE ELECTRICAL SERVICES OPENINGS. PROVIDE NECESSARY SLEEVES, ESCUTCHEONS AND COVERS.
- 2.2.3. DRILL AND PROVIDE ANCHORS AS REQUIRED FOR EXPANSION BOLTS, HANGER RODS, BRACKETS AND SUPPORTS.

2.3. TESTING
- 2.3.1. MEGGER CIRCUITS UP TO 350V WITH A 500V INSTRUMENT.
- 2.3.2. MEGGER CIRCUITS BETWEEN 350V TO 600V WITH A 1000V INSTRUMENT.
- 2.3.3. CHECK RESISTANCE TO GROUND BEFORE ENERGIZING ANY PART OF THE WORK.
- 2.3.4. TEST ALL LUMINAIRES, CONTROLS, WIRING DEVICES, ELECTRIC HEATERS, CIRCUIT BREAKERS, DISCONNECT SWITCHES, MOTOR STARTERS, AND EMERGENCY LIGHTING UNIT EQUIPMENT FOR CORRECT OPERATION AND ABSENCE OF SHORTS OR GROUNDS.
- 2.3.5. PUT EQUIPMENT AND SYSTEMS IN SERVICE AS MAY BE REQUESTED BY ENGINEER FOR TRIAL USE PROVIDED NO HAZARD OR DAMAGE WILL RESULT NOR GUARANTEES VOIDED.
- 2.3.6. CONTRACTOR SHALL COORDINATE INSPECTION DATE WITH ENGINEER AND SHALL PROVIDE LABOR FOR ACCESS TO ALL EQUIPMENT FOR INSPECTION. SUCH ACCESS SHALL IMPLY REMOVAL OF PANEL COVERS, OPENING OF DISCONNECT SWITCHES JUNCTION/PULL BOXES, STARTERS AND LUMINAIRES, TO CONFIRM WORK METHOD.

3. CONDUIT AND FITTINGS

3.1. EMT CONDUIT WITH STEEL SET SCREW CONNECTORS THROUGHOUT UNLESS NOTED OTHERWISE.

3.2. ALL EMPTY CONDUITS SHALL BE COMPLETE WITH PULL CORD. INSTALL NYLON INSULATED BUSHINGS ON ALL CABLE "CONDUIT ENDS".

3.3. SUPPORT ALL BOXES INDEPENDENTLY OF CONNECTING CONDUITS.

3.4. DO NOT USE SUPPORTS OR EQUIPMENT INSTALLED FOR OTHER TRADES FOR CONDUIT (OR CABLE) SUPPORT, EXCEPT WITH PERMISSION OF OTHER TRADES AND APPROVAL OF ENGINEER.

3.5. DO NOT USE WIRE LASHING OR PERFORATED STRAPPING TO SUPPORT OR SECURE RACEWAYS (OR CABLES).

3.6. PROVIDE ADEQUATE SUPPORT FOR RACEWAYS (AND CABLES) DROPPED VERTICALLY TO EQUIPMENT, WHERE THERE IS NO WALL SUPPORT.

3.7. FASTEN EXPOSED CONDUIT (OR CABLES) TO BUILDING CONSTRUCTION OR SUPPORT SYSTEM USING ONE OR TWO HOLE STEEL STRAPS.

3.8. INSTALL CONNECTORS ON SURFACE CONDUITS, SO THAT SCREW HEADS DO NOT POSE A DANGER TO OCCUPANTS.

3.9. ALL ELECTRICAL AND COMMUNICATION CONDUITS SHALL BE COLOR CODED AS REQUIREMENTS. OBTAIN COLOR CODING LIST FROM USER.

3.10. RIGID PVC DUCT SHALL BE USED FOR ALL DIRECT BURIED UNDERGROUND WORK.

4. WIRE AND CABLE

4.1. ALL WIRING SHALL BE RUN IN CONDUIT CONCEALED IN FINISHED AREAS AND SHALL BE RUN PARALLEL TO BUILDING LINES.

4.2. ALL EXPOSED WIRING SHALL BE RUN PARALLEL TO BUILDING LINES (SERVICE AREAS ONLY).

4.3. WIRING:
- 4.3.1. AC90 (UP TO 3m LENGTHS WHERE PERMITTED).
- 4.3.2. ARMOURED CABLE (BX) SHALL NOT BE USED.
- 4.3.3. RWU90 IN PVC DUCT (UNDERGROUND)
- 4.3.4. RW90 IN EMT CONDUIT, C/W STEEL SET-SCREW CONNECTORS AND COUPLINGS
- 4.3.5. RW90 IN LIQUID TIGHT FLEXIBLE. CONDUIT FOR CONNECTION TO PROCESS EQUIPMENT.
- 4.3.6. CONDUCTORS; #12 RW90, 600V, CU, MINIMUM, IN EMT CONDUIT.

4.4. IDENTIFY WIRING WITH PERMANENT INDELIBLE IDENTIFYING MARKINGS, EITHER NUMBERED OR COLORED TAPES, ON BOTH ENDS OF PHASE CONDUCTORS OF FEEDERS AND BRANCH CIRCUIT WIRING, AND MAINTAIN PHASE SEQUENCE AND COLOR CODING THROUGHOUT.

4.5. WIRING BELOW 50mm A.F.F. SHALL CONFORM TO CEC RULE 20-102.

4.6. ASSURE THAT ALL CONDUCTORS ARE SIZED FOR MAXIMUM VOLTAGE DROP:
- 4.6.1. BRANCH CIRCUITS - MAX. 2%

4.7. ALL SOLID COPPER CONDUCTORS WITH THERMOPLASTIC INSULATION (TYPE RW90, 600V) BRANCH WIRING SHALL BE MINIMUM #12 AWG (MAXIMUM 21.4m); #10 AWG (MAXIMUM 36.6m); FOR RUNS EXCEEDING 36.6m VOLTAGE DROP SHALL BE CALCULATED AT THE MAXIMUM OF 2%. #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED COPPER. USE CONNECTORS, CLAMPS AND SUPPORTS TO SUIT.

5. OUTLET, PULL & JUNCTION BOXES

5.1. PROVIDE ELECTRO-GALVANIZED STEEL 'FS' TYPE UTILITY BOXES FOR OUTLETS CONNECTED TO SURFACE-MOUNTED CONDUIT. BOXES SHALL BE CODE GAUGE AND SIZED TO MEET THE CANADIAN ELECTRICAL CODE REQUIREMENTS. PROVIDE PROPER 'FS' STYLE COVERPLATES FOR SAID BOXES.

5.2. PROVIDE WELDED STEEL JUNCTION/PULL BOXES WITH HINGED COVERS FOR SURFACE MOUNTING AS REQUIRED TO FACILITATE CONDUCTOR INSTALLATION. GENERALLY SUCH BOXES WILL BE LOCATED SO AS NOT TO EXCEED 30.5m OF CONDUIT RUN AND 2-90 DEGREE BENDS BETWEEN PULL BOXES. PROVIDE ADDITIONAL JUNCTION/PULL BOXES AS REQUIRED. ENSURE ALL JUNCTION/PULL BOXES ARE ACCESSIBLE WHEN ALL WORK IS COMPLETE.

5.3. SUPPORT ALL BOXES INDEPENDENTLY OF CONNECTING CONDUITS.

6. EMPTY CONDUIT FOR PROCESS COMMUNICATION SYSTEM

6.1. PROVIDE EMPTY CONDUIT TO CEILING SPACE FOR ALL PROCESS SYSTEMS.

6.2. BUSH BOTH ENDS OF ALL COMMUNICATIONS CONDUITS AND BOND AT ONE END.

6.3. PROVIDE POLYPROPYLENE FISH ROPE IN ALL EMPTY CONDUITS. ANCHOR AT EACH END.

7. GROUNDING

7.1. THE ENTIRE ELECTRICAL SYSTEM, AS PERTAINS TO THIS INSTALLATION, SHALL, BE GROUNDED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE SECTION 10 AND LOCAL AUTHORITY HAVING JURISDICTION OVER INSTALLATION.

7.2. MAKE GROUNDING CONNECTIONS IN RADIAL CONFIGURATION ONLY, WITH CONNECTIONS TERMINATING AT SINGLE GROUNDING POINT. AVOID LOOP CONNECTIONS.

7.3. ALL METAL PIPING SUCH AS, BUT NOT LIMITED TO, WATER, SEWAGE AND GAS, SHALL BE BONDED WITH MINIMUM #6 AWG TO THE MAIN SYSTEM GROUND.

8. PROCESS EQUIPMENT

8.1. SEE SINGLE LINE DIAGRAM AND LEGEND FOR ALL REQUIRED PROCESS EQUIPMENT ELECTRICAL CONNECTIONS. THE ELECTRICAL TRADE SHALL PROVIDE THE FOLLOWING:
- 8.1.1. THE NECESSARY POWER DISTRIBUTION EQUIPMENT AT THE ELECTRICAL ROOM.
- 8.1.2. THE NECESSARY CONDUIT AND WIRE TO THE PROCESS EQUIPMENT LOCATION.
- 8.1.3. A TERMINATING DISCONNECT SWITCH, UNLESS PROVIDED FOR BY THE EQUIPMENT MANUFACTURER.
- 8.1.4. ANY MISCELLANEOUS ITEMS NECESSARY TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS.
- 8.1.5. ALL CONDUIT AND WIRING FROM THE TERMINATING DISCONNECT SWITCH TO THE PROCESS EQUIPMENT UNLESS NOTED OTHERWISE. LOW VOLTAGE CONTROLS, SHALL BE PROVIDED BY THE PROCESS TRADE.
- 8.1.6. THE ELECTRICAL TRADE SHALL VERIFY ALL MOTOR CONNECTIONS FOR PROPER PHASE ROTATION, WHERE APPLICABLE.

9. ELECTRICAL BREAKER:

9.1. PROVIDE CIRCUIT BREAKER FOR EXISTING PANELBOARDS. MOLDED CASE, BOLT-ON, QUICK MAKE-QUICK BREAK, THERMAL-MAGNETIC TRIPPING BREAKER WITH (SYMMETRICAL) INTERRUPTING CAPACITY AS INDICATED. CIRCUIT BREAKER SHALL BE NEW WITH FULL MANUFACTURER'S WARRANTY AND PURCHASED THROUGH AUTHORIZED DISTRIBUTOR.

9.2. PROVIDE TYPE WRITTEN DIRECTORIES IN ALL PANELS SHOWING TYPE AND LOCATION OF EACH CIRCUIT.

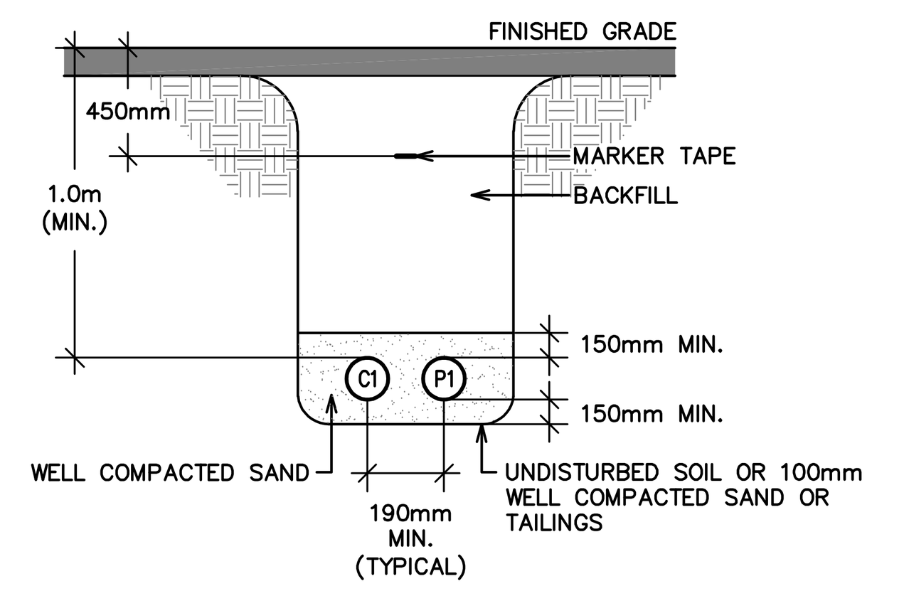
9.3. ACCEPTABLE MANUFACTURERS: EATON, SIEMENS, SCHNEIDER-ELECTRIC.

9.4. NEW BREAKER FRAMES SHALL MATCH EXISTING PANELBOARDS.

9.5. UPDATE REVISED PANEL LEGENDS AT END OF CONSTRUCTION.

6 E-1 ELECTRICAL SPECIFICATIONS N.T.S.

C1 = 27mm RIGID PVC CONDUIT FOR COMMUNICATIONS
P1 = 27mm RIGID PVC CONDUIT FOR POWER



7 E-1 TRENCH DETAIL B-B N.T.S.

EQUIPMENT CONNECTIONS AND CONTROLS

- DIRECT CONNECTION AS SPECIFIED
- MOTOR CONNECTION AS SPECIFIED
- VFD VARIABLE FREQUENCY DRIVE

ABBREVIATIONS

- DEL - INDICATES DEVICE TO BE DELETED
- EX - INDICATES EXISTING DEVICE TO REMAIN

MISCELLANEOUS

- ◇1 ELECTRICAL DRAWING NOTES

8 E-1 LEGEND N.T.S.

SHEET LIST:

- E-1 ELECTRICAL SITE PLAN AND SPECIFICATIONS
- E-2 ELECTRICAL BLOWER BUILDING FLOOR PLANS AND SINGLE LINE DIAGRAMS
- P01 DISSOLVED OXYGEN UPGRADE SITE PLAN & DETAILS
- P02 NEW BLOWER PLANS, SECTIONS & DETAILS
- P03 PROCESS SPECIFICATION PAGE 1 OF 2
- P04 PROCESS SPECIFICATION PAGE 2 OF 2

9 E-1 SHEET LIST N.T.S.

CLIENT:

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Province of New Brunswick
M7172
Timothy S. Dulenty
[illegible]
Signature
07/10/22
Date
Province du Nouveau-Brunswick
INGÉNIEUR IMMATRICULÉ

NO:	REVISIONS	DATE YYYY/MM/DD	INIT.
0	ISSUED FOR TENDER	2022/10/07	T.D.

PROJECT TITLE:

LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

DRAWING TITLE:

ELECTRICAL SITE PLAN AND SPECIFICATIONS

SCALE: AS NOTED

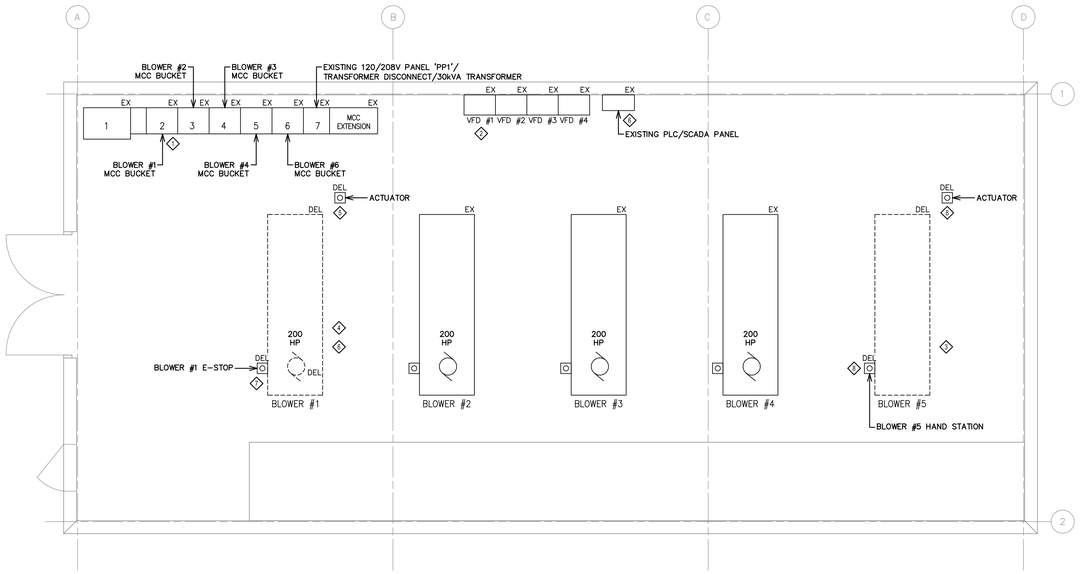
DATE: APRIL, 2022

DRAWN BY: R.M.S.

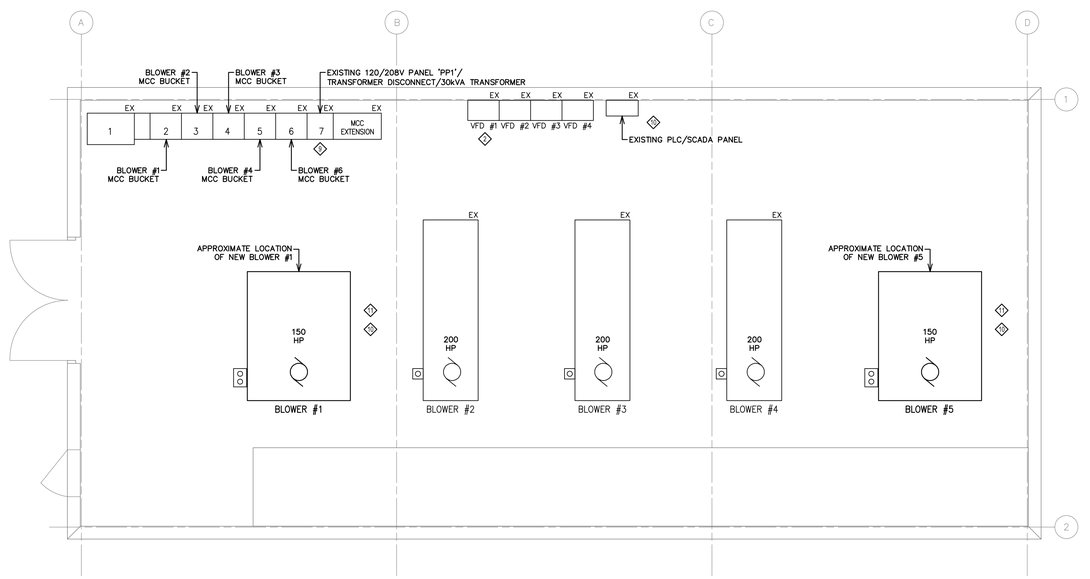
CHECKED BY: R.W.R.

DRAWING NO: **E-1**

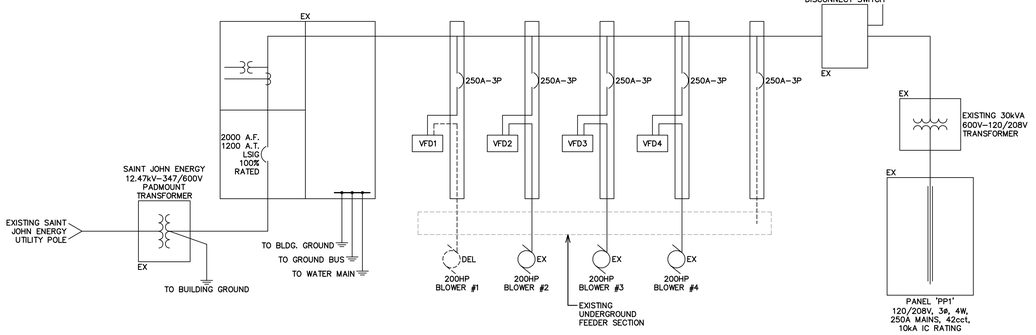
Sheet Size: B1



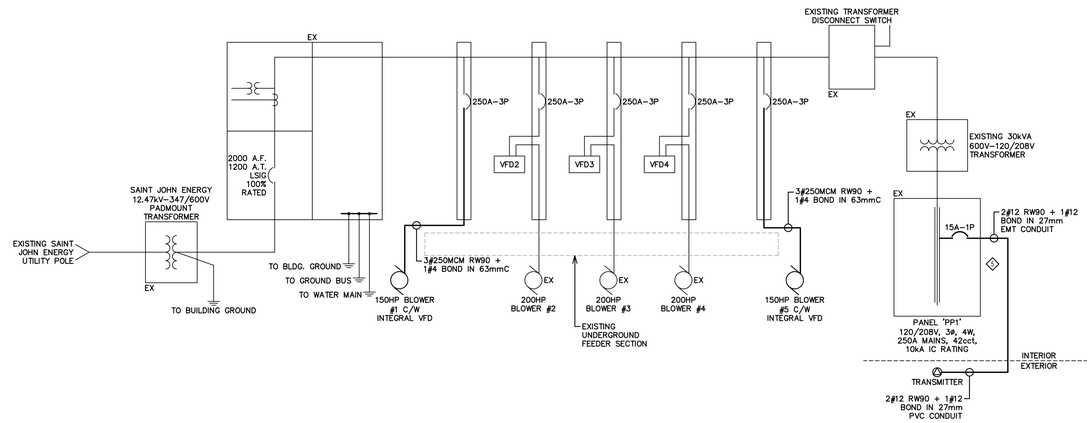
1 E-2 BLOWER BUILDING FLOOR PLAN - DEMOLITION SCALE 1:50



2 E-2 BLOWER BUILDING FLOOR PLAN - NEW WORK SCALE 1:50



3 E-2 ELECTRICAL SINGLE LINE DIAGRAM - DEMOLITION N.T.S.



4 E-2 ELECTRICAL SINGLE LINE DIAGRAM - NEW WORK N.T.S.

CONTROLS WIRING SCHEDULE				
TAG	WIRE	CONDUIT	WIRING TO	WIRING FROM
D01–D10	10#14 LOW VOLTAGE WIRING	27mmC	BLOWER #1	PLC
A01&A02	2#16 TWISTED SHIELDED PAIR			
D11&D20	10#14 LOW VOLTAGE WIRING	27mmC	BLOWER #5	PLC
A03&A04	2#16 TWISTED SHIELDED PAIR			
A05&A06	2#16 TWISTED SHIELDED PAIR	27mmC	TRANSMITTER	PLC

5 E-2 CONTROLS WIRING SCHEDULE N.T.S.

GENERAL NOTES:

1. ELECTRICAL CONTRACTOR TO COORDINATE ALL REMOVALS WITH OTHER TRADES INVOLVED AND SAINT JOHN CITY WATER OPERATORS. TURN OVER ALL EQUIPMENT REMOVED TO THE CITY OF SAINT JOHN FOR FIRST RIGHT OF REFUSAL. PROPERLY DISPOSE OF REFUSED MATERIAL. COORDINATE FOR PATCHING AND PAINTING.
2. ELECTRICAL CONTRACTOR TO COORDINATE ON SITE FOR EXACT CONDUIT ROUTING.

DEMOLITION NOTES:

1. REMOVE FEEDER FROM EXISTING BLOWER #1 MCC BUCKET TO THE EXISTING VFD #1. WIRE BACK TO SOURCE OF SUPPLY.
2. EXISTING VFD #1 TO REMAIN AS SPARE.
3. REMOVE FEEDER FROM EXISTING BLOWER #5 PAD BACK TO EXISTING BREAKER IN EXISTING MCC BUCKET #6. EXISTING BREAKER IS TO REMAIN.
4. REMOVE FEEDER FROM EXISTING BLOWER #1 BACK TO VFD #1 ENCLOSURE.
5. REMOVE BLOWER #1 INLET ACTUATOR AND ASSOCIATED WIRING BACK TO EXISTING PLC/SCADA PANEL.
6. REMOVE BLOWER #1 DISCHARGE TEMPERATURE SENSOR AND PRESSURE SENSOR ALONG WITH ASSOCIATED WIRING BACK TO EXISTING PLC/SCADA PANEL.
7. REMOVE BLOWER #1 EXISTING E-STOP AND ASSOCIATED WIRING BACK TO SOURCE OF SUPPLY.
8. REMOVE BLOWER #5 INLET ACTUATOR WIRING BACK TO EXISTING PLC/SCADA PANEL AND HAND STATION ALONG WITH ASSOCIATED WIRING BACK TO SOURCE OF SUPPLY.

NEW WORK NOTES:

1. ELECTRICAL CONTRACTOR TO SUPPLY AND INSTALL ONE (1) 15A-1P BREAKER IN EXISTING PANEL 'PP1' COMPLETE WITH 2#12 RW90 + 1#12 BOND IN 27mmC TO SUPPLY POWER TO NEW TRANSMITTER. REFER TO 1/E-1 FOR APPROXIMATE LOCATION OF NEW TRANSMITTER.
2. ELECTRICAL CONTRACTOR TO SUPPLY AND INSTALL 10#14 CONDUCTORS FOR DIGITAL I/O AND 2#16 TWISTED PAIR FOR ANALOG I/O IN 27mmC FROM PLC/SCADA PANEL TO NEW BLOWER LOCATION.
3. ELECTRICAL CONTRACTOR TO PROVIDE SUPPORTS FASTENED TO THE STEEL BEAMS FOR VERTICAL RUN OF CONDUIT TO THE BLOWERS.

6 E-2 NOTES N.T.S.

Sheet Size: B1

CLIENT:
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Timothy Dulenty
07/10/22
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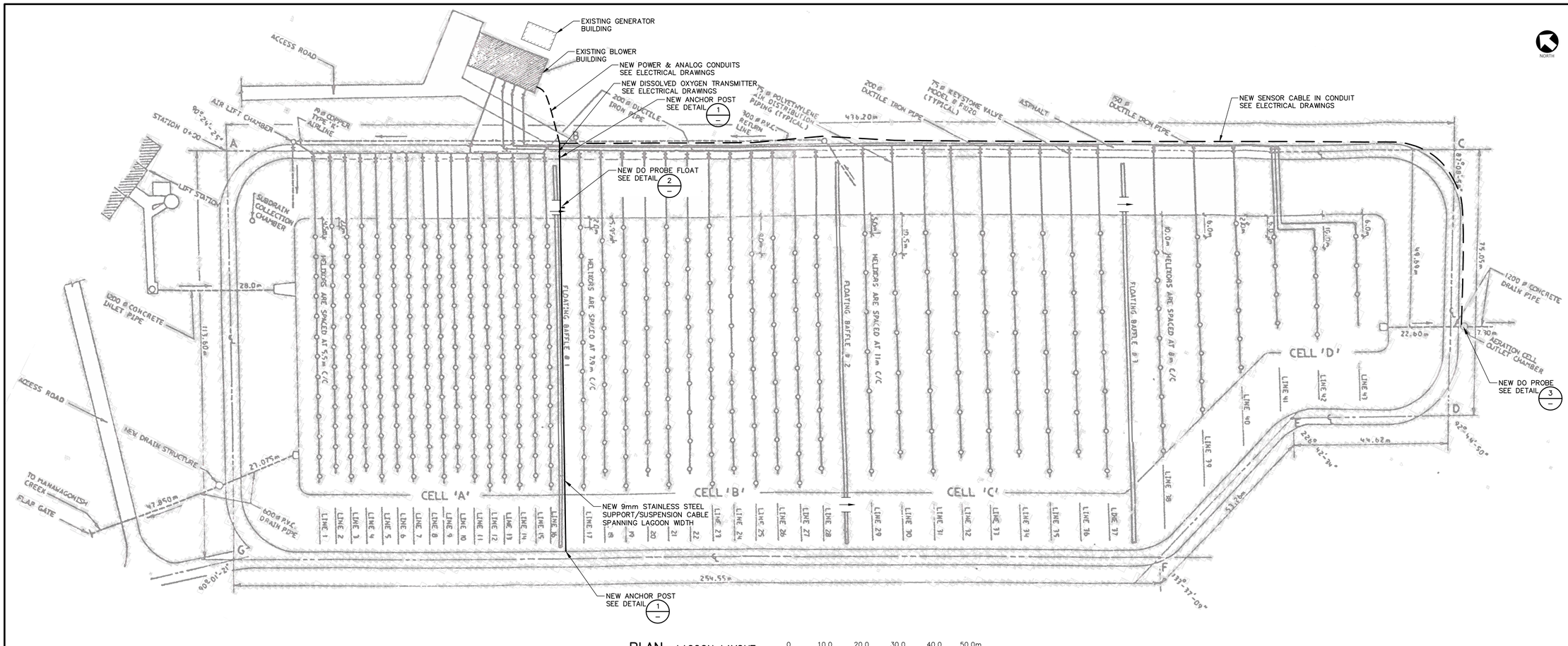
NO:	REVISIONS	DATE YYYY/MM/DD	INIT.
0	ISSUED FOR TENDER	2022/10/07	T.D.

PROJECT TITLE:
LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

DRAWING TITLE:
ELECTRICAL BLOWER BUILDING FLOOR PLANS AND SINGLE LINE DIAGRAMS

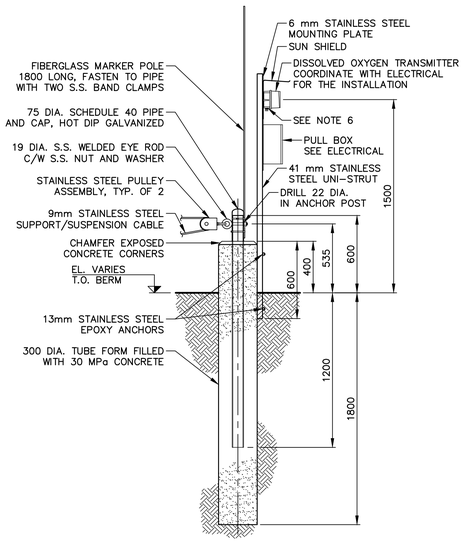
SCALE: AS NOTED
DATE: APRIL, 2022
DRAWN BY: R.M.S.
CHECKED BY: R.W.R.
DRAWING NO: **E-2**



PLAN— LAGOON LAYOUT

SCALE: 1:500m

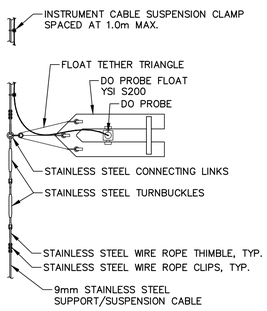
0 10.0 20.0 30.0 40.0 50.0m
1:500



1/— DETAIL— ANCHOR POST DETAIL

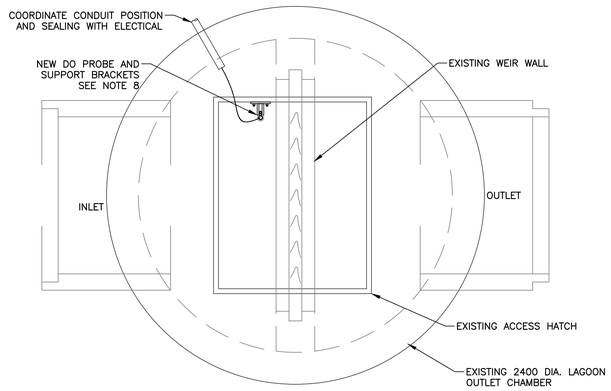
NTS

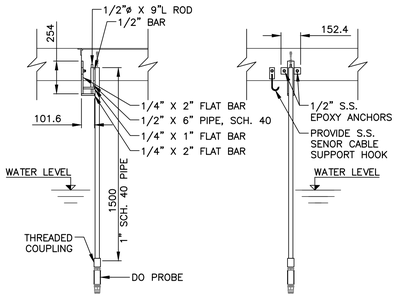
TYPICAL OF TWO (2) POSTS SEE NOTE 6 & 7



2/— DETAIL— DO PROBE FLOAT

NTS





3/— DETAIL— DO PROBE IN CHAMBER

NTS

NOTE: ALL MATERIALS ARE TO BE STAINLESS STEEL

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PROCESS CONSULTANT:

CBCL

NOTES:

1. THE EXISTING TREATMENT FACILITY IS FULLY OPERATIONAL. MINIMIZE AND SCHEDULE OPERATIONAL SHUTDOWNS AND DISTURBANCES. PROVIDE ACCESS FOR MAINTENANCE STAFF FOR ROUTINE MAINTENANCE AND INSPECTION. ALL ACTIVITIES AFFECTING OPERATION OF THE FACILITY SHALL BE COORDINATED WITH SAINT JOHN WATER.
2. GIVE 72 HOURS WRITTEN NOTICE OF ALL WORK WHICH MAY INTERRUPT OR INTERFERE WITH THE OPERATION OF THE EXISTING FACILITY.
3. ALL WORK TO BE DONE IN ACCORDANCE WITH FEDERAL AND PROVINCIAL REGULATIONS INCLUDING THE NEW BRUNSWICK DEPARTMENT OF THE ENVIRONMENT AND LOCAL GOVERNMENT AND THE NEW BRUNSWICK DEPARTMENT OF JUSTICE AND PUBLIC SAFETY. FOLLOW ALL RELEVANT LOCAL GOVERNMENT AND SAINT JOHN WATER POLICIES.
4. COORDINATE DISSOLVED OXYGEN SUPPLY AND INSTALLATION BETWEEN ALL DISCIPLINES.
5. ALL MATERIALS TO BE SUITABLE FOR AN AQUATIC WASTEWATER ENVIRONMENT.
6. DISSOLVED OXYGEN TRANSMITTER TO BE INSTALL ON ONE POST CLOSEST TO THE BLOWER BUILDING. COORDINATE ELECTRICAL AND INSTRUMENT CONNECTIONS AND CABLING WITH ELECTRICAL AND MANUFACTURERS REPRESENTATIVE.
7. LOCATE BAFFLE CURTAIN ANCHORS, LAGOON LINER KEY, AND EXISTING VALVE BOXES PRIOR TO POSITIONING ANCHOR POSTS. CONFIRM POSITIONING WITH ENGINEER AND SAINT JOHN WATER BEFORE DRILLING FOR ANCHOR POST TUBE FORMS.
8. POSITION PROBE HOLDER TO ALLOW MAINTENANCE ACCESS FROM OUTSIDE OF THE EXISTING RAILING. COORDINATE POSITIONING WITH SAINT JOHN WATER.

STAMP:

LICENCED PROFESSIONAL ENGINEER
Province of New Brunswick
L4093 2022
Michael Abbott
Signature
Oct. 7, 2022
Date
INGENIEUR TITULAIRE DE PERMIS
Province du Nouveau-Brunswick

NO:	REVISIONS	DATE YYYY/MM/DD	INIT.
0	ISSUED FOR TENDER	2022/10/7	DA
B	ISSUED FOR 99% REVIEW	2022/07/20	DA
A	ISSUED FOR REVIEW	2022/05/13	DA

PROJECT TITLE:

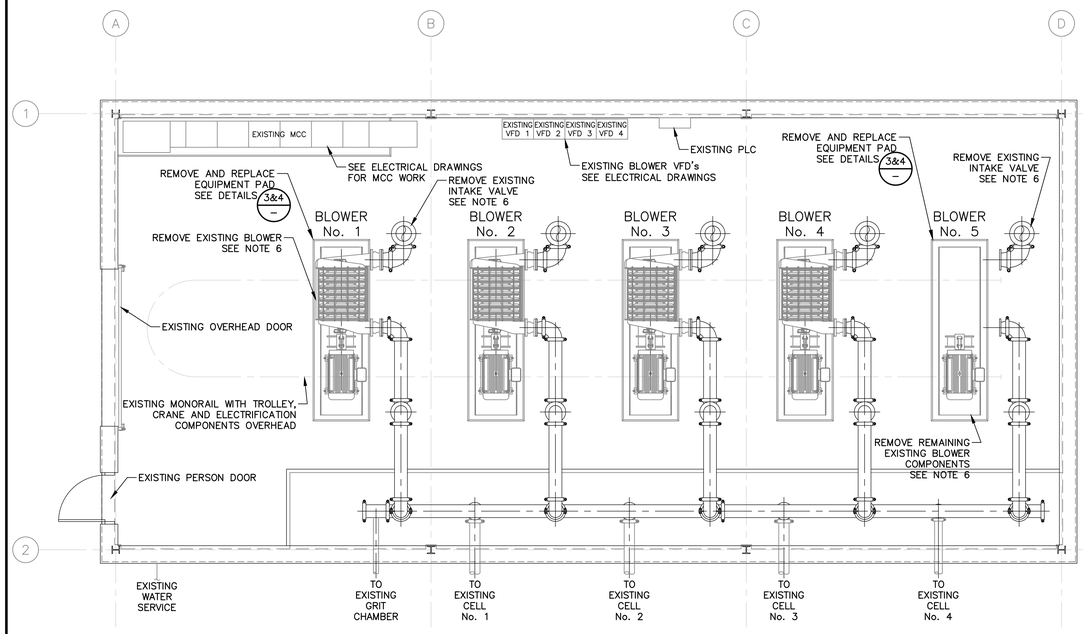
LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

DRAWING TITLE:

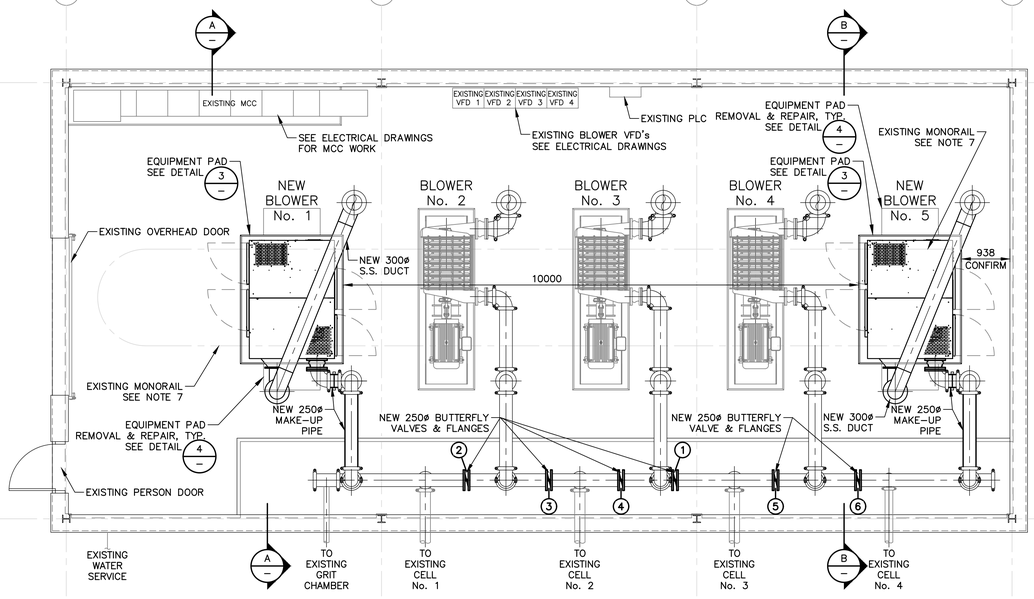
DISSOLVED OXYGEN UPGRADE SITE PLAN & DETAILS

SCALE:	DATE:
AS NOTED	APRIL, 2022
DRAWN BY: D. ABREY	DRAWING NO: P01
CHECKED BY: M. ABBOTT	

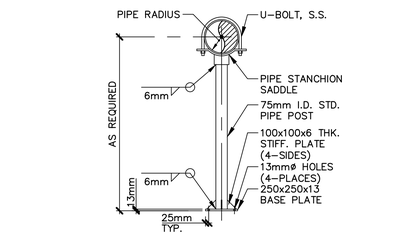
Sheet Size: B1



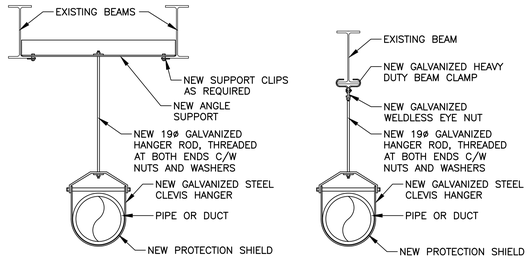
PLAN— BLOWER BUILDING
SCALE: 1:50 EXISTING



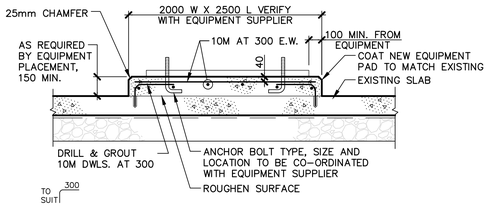
PLAN— BLOWER BUILDING
SCALE: 1:50 MODIFIED



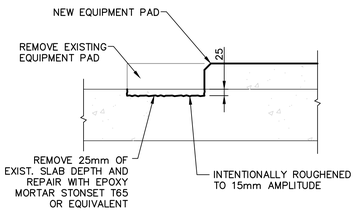
1 DETAIL— PIPE STANCHION SUPPORT
NTS NOTE: HOT DIP GALVANIZE AFTER FABRICATION



2 DETAIL— PIPE HANGER
NTS

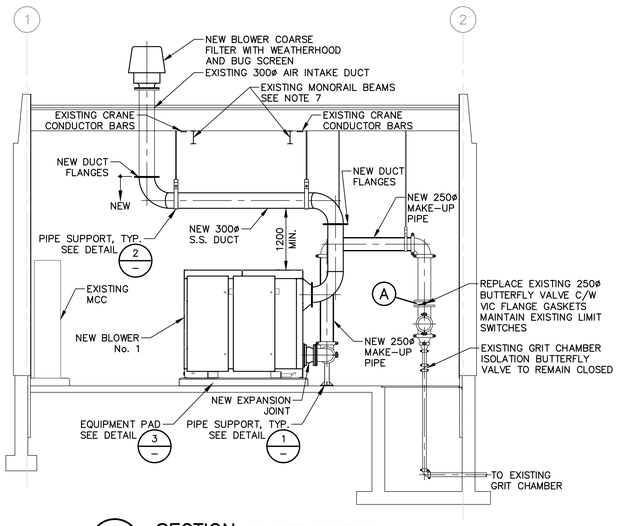


3 DETAIL— NEW EQUIPMENT PAD
NTS

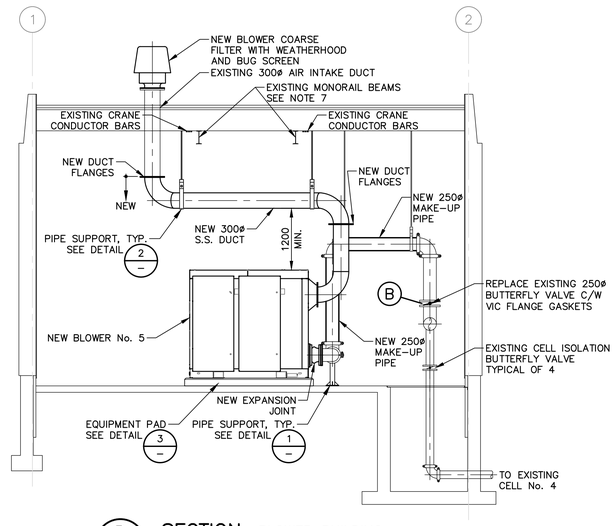


4 DETAIL EQUIPMENT PAD REMOVAL & REPAIR
NTS

NOTE: COAT REPAIRED AREAS TO MATCH EXISTING.



A SECTION— BLOWER BUILDING
SCALE: 1:50 BLOWER No.1 MODIFIED



B SECTION— BLOWER BUILDING
SCALE: 1:50 BLOWER No.5 MODIFIED

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PROCESS CONSULTANT:
CBCL

NOTES:

1. THE EXISTING TREATMENT FACILITY IS FULLY OPERATIONAL. MINIMIZE AND SCHEDULE OPERATIONAL SHUTDOWNS AND DISTURBANCES. PROVIDE ACCESS FOR MAINTENANCE STAFF FOR ROUTINE MAINTENANCE AND INSPECTION. ALL ACTIVITIES AFFECTING OPERATION OF THE FACILITY SHALL BE COORDINATED WITH SAINT JOHN WATER.
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3. ALL WORK TO BE DONE IN ACCORDANCE WITH FEDERAL AND PROVINCIAL REGULATIONS INCLUDING THE NEW BRUNSWICK DEPARTMENT OF THE ENVIRONMENT AND LOCAL GOVERNMENT AND THE NEW BRUNSWICK DEPARTMENT OF JUSTICE AND PUBLIC SAFETY. FOLLOW ALL RELEVANT LOCAL GOVERNMENT AND SAINT JOHN WATER POLICIES.
4. EXISTING VICTAULIC FITTINGS MAY BE RE-USED WITH NEW EPDM HIGH TEMPERATURE SEALS.
5. PROCESS PIPEWORK MATERIALS:
   LOW PRESSURE DISCHARGE AIR PIPE – SCHEDULE 40 STEEL
   LOW PRESSURE SUPPLY AIR DUCT – SCHEDULE 5 STAINLESS STEEL
6. TURN OVER REMOVED BLOWER COMPONENTS AND ACCESSORIES OVER TO THE SAINT JOHN WATER.
7. AT EXISTING OVERHEAD MONORAIL PROVIDE CLEARANCE FOR FOR NEW EQUIPMENT TO SAFELY OPERATE TROLLEY, CRANE AND ELECTRIFICATION COMPONENTS.
8. SUGGESTED WORK SEQUENCE;
   - ISOLATE BLOWER No. 5 AT VALVE 'A'
   - REMOVE EXISTING BLOWER No. 5
   - INSTALL NEW BLOWER No. 5
   - OPEN VALVE 'A' AND COMMISSION NEW BLOWER No. 5
   - ISOLATE BLOWER No. 1 AT VALVE 'B'
   - REMOVE EXISTING BLOWER No. 1
   - INSTALL NEW BLOWER No. 1
   - OPEN VALVE 'B' AND COMMISSION NEW BLOWER No. 1
   - COORDINATE WITH SJW TO ELEVATE THE DISSOLVED OXYGEN LEVELS IN ALL CELLS
   - ISOLATE BLOWER AND CELL VALVES, INSTALL NEW VALVE '1' WITH A VIC-FLANGE AND A SERIES 400 UNI-FLANGE
   - ISOLATE ONLY THE BLOWERS AND CELLS REQUIRED TO INSTALL VALVES '2' TO '6' USING SERIES 400 UNI-FLANGES

STAMP:
LICENCED PROFESSIONAL ENGINEER
Province of New Brunswick
L4093 2022
Michael Abbott
Signature
Oct. 7, 2022
Date
INGENIEUR TITULAIRE DE PERMIS
Province du Nouveau-Brunswick

NO:	REVISIONS	DATE YYYY/MM/DD	INIT.
0	ISSUED FOR TENDER	2022/10/7	DA
B	ISSUED FOR 99% REVIEW	2022/07/20	DA
A	ISSUED FOR REVIEW	2022/05/13	DA

PROJECT TITLE:
LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

DRAWING TITLE:
NEW BLOWER PLANS, SECTION & DETAILS

SCALE:	DATE:
AS NOTED	APRIL, 2022
DRAWN BY: D. ABREY	DRAWING NO: P02
CHECKED BY: M. ABBOTT	

Sheet Size: D1

PROCESS INSTRUMENTATION:

1. GENERAL

1.1 WORK INCLUDED

.1 THIS SECTION AND ITS ASSOCIATED DRAWINGS SPECIFIES THE REQUIREMENTS FOR THE SUPPLY, CALIBRATION, INSTALLATION, CABLING, TERMINATION, TESTING AND COMMISSIONING OF THE INSTRUMENTATION AND CONTROLS EQUIPMENT.

.2 THE INSTRUMENTATION AND CONTROLS SCOPE OF WORK AS DESCRIBED IN THIS SECTION AND AS SHOWN ON THE DRAWINGS ALSO CONSISTS OF THE FOLLOWING:
- .1 DESIGN, SUPPLY, CALIBRATE, INSTALL, TEST AND COMMISSION NEW INSTRUMENTATION AND CONTROLS EQUIPMENT AS IDENTIFIED HEREIN AND ON THE DRAWINGS.
- .2 SUPPLY AND INSTALL NEW INSTRUMENTATION AND CONTROL WIRING, CABLES AND ASSOCIATED CONDUITS.

.3 DETERMINE THE INSTRUMENTATION AND CONTROLS EQUIPMENT/CABLING TERMINATION DETAILS TO REFLECT THE EQUIPMENT AND PANELS ACTUALLY SUPPLIED (AFTER SHOP DRAWING APPROVAL), AND TO MATCH THE INTENT AS INDICATED OR IMPLIED IN THE CONTRACT DOCUMENTS, TO SUPPLY A COMPLETE AND FUNCTIONING SYSTEM. DOCUMENT THE ABOVE INSTRUMENTATION AND CONTROLS CABLING TERMINATION DETAILS IN THE FORM OF EITHER "AS-BUILT" TERMINATION DETAIL DRAWINGS/LOOP DRAWINGS (IN CAD FORMAT) OR "AS-BUILT" CABLING TERMINATION SCHEDULES (IN MICROSOFT EXCEL FORMAT). SUBMIT COMPLETED DRAWINGS/SPREADSHEETS TO THE CONSULTANT AND ALSO INCLUDED IN THE OPERATION AND MAINTENANCE MANUALS,

.4 STORE AND PROTECT INSTRUMENTATION AND CONTROLS EQUIPMENT AWAITING INSTALLATION.

.5 REPAIR/REPLACE EQUIPMENT DAMAGED DURING CONSTRUCTION, OR OTHERWISE DEEMED DEFECTIVE OR NON-COMPLIANT WITH THIS SPECIFICATION.

1.2 REFERENCES

.1 CARRY OUT THE WORK UNDER THIS SECTION IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, PROVINCIAL, MUNICIPAL AND OTHER LAWS, ORDINANCES AND WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS WHICH WILL BE DEEMED TO BE AND FORM PART OF THIS SPECIFICATION:
- .1 AMERICAN SOCIETY OF MECHANICAL ENGINEERS.
- .2 INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS.
- .3 AMERICAN SOCIETY FOR TESTING MATERIALS.
- .4 MANUFACTURERS STANDARDIZATION SOCIETY.
- .5 CANADIAN STANDARDS ASSOCIATION.
- .6 INSTRUMENT SOCIETY OF AMERICA.
- .7 CANADIAN ELECTRICAL CODE.

.2 IN THE EVENT OF A CONFLICT BETWEEN THE ABOVE MENTIONED STANDARDS, THIS SPECIFICATION, OR THE ATTACHED DRAWINGS, NOTIFY THE CONSULTANT, WHO WILL THEN ADVISE ON WHICH STANDARD IS TO BE FOLLOWED.

.3 CARRY OUT INSTRUMENTATION WORK (INSTRUMENTATION MOUNTING, TUBING, CABLING, TERMINATING, CALIBRATION AND COMMISSIONING) BY CERTIFIED INTER-PROVINCIAL TICKETED INSTRUMENT TRADESPERSON. INCLUDE THESE SERVICES IN THE CONTRACT PRICE.

1.3 SUBMITTALS

.1 SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH GENERAL REQUIREMENTS. CONFIRM SHOP DRAWINGS HAVE BEEN SUITABLY REVIEWED BY THE CONSULTANT BEFORE ANY EQUIPMENT IS ORDERED.

.2 INSTRUMENTATION AND CONTROLS EQUIPMENT SHOP DRAWINGS TO INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
- .1 COMPLETE MODEL NUMBER OF EACH INSTRUMENT BEING PROPOSED, WITH MODEL NUMBER BREAKDOWN CODES.
- .2 APPLICABLE INSTRUMENT/EQUIPMENT TAG NUMBERS SHALL BE IDENTIFIED ON EVERY SHOP DRAWING.
- .3 EQUIPMENT OPERATIONAL SPECIFICATIONS.
- .4 EQUIPMENT DIMENSIONS, WEIGHT, MOUNTING DETAILS AND MATERIALS OF CONSTRUCTION.
- .5 EQUIPMENT POWER REQUIREMENTS, INSTRUMENT AIR REQUIREMENTS, PROCESS SIGNAL TYPE, ETC.
- .6 ELECTRICAL TERMINATION INFORMATION SPECIFIC TO THE DEVICE BEING PURCHASED IN THIS CONTRACT.
- .7 COMPLETE PARTS LIST WITH RECOMMENDED INVENTORY OF SPARE PARTS.
- .8 FREQUENCY AND METHOD OF CALIBRATION, (IF APPLICABLE).
- .9 MANUFACTURER'S INSTALLATION RECOMMENDATIONS/REQUIREMENTS.
- .10 ANY SIZING CALCULATIONS, (IF APPLICABLE).
- .11 UPON REQUEST BY THE CONSULTANT, SUPPLY A SIMILAR APPLICATION USER LIST, COMPLETE WITH CONTACT NAMES AND PHONE NUMBERS, FOR ANY PROPOSED INSTRUMENT THE CONSULTANT HAS NO EXPERIENCE WITH. FAILURE TO PRODUCE A REQUESTED USER LIST, OR A REVIEW BY A CONTACTED USER, WILL RESULT IN THE AUTOMATIC REJECTION OF THE PROPOSED INSTRUMENT.

.3 SUBMIT DATA FOR OPERATIONS AND MAINTENANCE MANUALS IN ACCORDANCE WITH THE GENERAL REQUIREMENTS. INCLUDE INFORMATION BASED ON THE FOLLOWING REQUIREMENTS:
- .1 OPERATION AND MAINTENANCE INSTRUCTIONS TO BE SUFFICIENTLY DETAILED WITH RESPECT TO DESIGN ELEMENTS, CONSTRUCTION FEATURES, COMPONENT FUNCTION AND MAINTENANCE REQUIREMENTS, TO PERMIT EFFECTIVE START-UP, OPERATION, CALIBRATION, MAINTENANCE AND REPAIR OF THE SUPPLIED EQUIPMENT.
- .2 INCLUDE NAMES AND ADDRESSES OF LOCAL SUPPLIERS FOR ALL ITEMS INCLUDED IN MAINTENANCE MANUALS.

.4 MAINTAIN AN "AS-BUILT" MARK-UP SET OF THE INSTRUMENTATION AND CONTROLS DRAWINGS ON SITE AND TURN OVER TO THE CONSULTANT AT THE END OF THE WORK.

2. PRODUCTS

2.1 INSTRUMENTATION – GENERAL

.1 INSTRUMENTATION AND CONTROLS EQUIPMENT TO BE OF A PROVEN DESIGN FOR EACH APPLICATION AND DESIGNED, MANUFACTURED, INSPECTED, AND TESTED TO COMPLY WITH THE APPLICABLE REGULATIONS, CODES, AND STANDARDS.

.2 SELECT INSTRUMENTATION AND CONTROLS EQUIPMENT TO SUIT THE PROCESS AND ENVIRONMENTAL REQUIREMENTS FOR EACH APPLICATION AS DESCRIBED OR IMPLIED IN THIS SPECIFICATION AND THE DRAWINGS.

.3 CONSTRUCT INSTRUMENTATION AND CONTROLS EQUIPMENT TO OPERATE SAFELY AND RELIABLY UNDER ALL OPERATING CONDITIONS WITHOUT UNDUE WEAR, VIBRATION, HEAT, NOISE, OR OTHER OPERATING PROBLEMS. PARTS SUBJECT TO WEAR, CORROSION, OR OTHER DETERIORATION, OR REQUIRING ADJUSTMENT, INSPECTION OR REPAIR, IS TO BE ACCESSIBLE AND CAPABLE OF CONVENIENT FIELD MAINTENANCE.

.4 INSTRUMENTATION AND CONTROLS EQUIPMENT WILL BE CERTIFIED BY AN AGENCY RECOGNIZED BY THE ELECTRICAL INSPECTION DEPARTMENT HAVING JURISDICTION (PREFERABLY CSA). WHERE THERE IS NO ALTERNATIVE TO SUPPLYING EQUIPMENT THAT IS NOT CERTIFIED, SPECIAL APPROVAL FROM THE APPLICABLE ELECTRICAL INSPECTION DEPARTMENT WILL BE REQUIRED. COSTS ASSOCIATED WITH OBTAINING SUCH APPROVAL WILL BE THE RESPONSIBILITY OF THE SUPPLIER.

.5 INSTRUMENTATION AND CONTROLS EQUIPMENT TO HAVE A MINIMUM ENCLOSURE RATING OF NEMA 4X.

.6 MINIMUM INSTRUMENTATION AND CONTROLS EQUIPMENT ELECTRICAL CONNECTION SIZE TO BE 13 MM NPT.

.7 INSTRUMENTATION AND CONTROLS EQUIPMENT REQUIRING A POWER SUPPLY MUST BE 120 VAC, 60 HZ.

.8 WIRED INSTRUMENTATION AND CONTROLS EQUIPMENT ARE TO HAVE PROVISION FOR EXTERNALLY GROUNDING THE INSTRUMENT HOUSING/ENCLOSURE.

.9 PROVIDE INSTRUMENTATION AND CONTROLS EQUIPMENT COMPLETE WITH A SECURELY FASTENED MANUFACTURER'S NAMEPLATE INDICATING INSTRUMENT MODEL, SERIAL NUMBER, CALIBRATED RANGE, ETC., AS REQUIRED FOR ORDERING A REPLACEMENT ITEM.

.10 SUPPLY INSTRUMENT TAGS FOR INSTRUMENTS INDICATED. AFFIX A STAINLESS STEEL TAG INDICATING THE INSTRUMENT TAG NUMBER AFFIXED TO THE INSTRUMENT USING STAINLESS STEEL WIRE. TAG TO BE APPROXIMATELY 50 MM X 25 MM AND SHALL BE STAMPED IN A LEGIBLE MANNER, WITH A MINIMUM 10 MM CHARACTER SIZE, AND IN THE SAME FORMAT AS SHOWN ON THE DRAWINGS.

2.2 DISSOLVED OXYGEN INSTRUMENTS

.1 PROVIDE TWO (2) DISSOLVED OXYGEN (DO) PROBES, ONE WITH 20 METRES OF CABLE AND ONE WITH 300 METRES OF CABLE, PLUS A SINGLE (1) TRANSMITTER, INCLUDING ALL MOUNTING HARDWARE. THE TRANSMITTER SHALL ALLOW FOR PROBE DUAL CHANNELS, PROVIDED WITH FOUR (4) 4-20 mA ANALOG OUTPUTS, TWO (2) ELECTROMECHANICAL RELAYS AND HOUSED IN A NEMA 4X ENCLOSURE COMPLETE WITH WEATHER AND SUN PROTECTION. THE DO TRANSMITTER SHALL BE MOUNTED ON STAINLESS STEEL UNI-STRUT SUPPORT. POWER AND ANALOG SIGNALS FOR THE DO ANALYZER TO REPORT TO/FROM THE BLOWER BUILDING. MOUNT TRANSMITTER, PROBES AND WIRE. THE DO PROBE WILL BE A CONTINUOUS-READING PROBE UTILIZING LUMINESCENT SENSOR TECHNOLOGY. ALL PARTS MUST BE CORROSION-RESISTANT AND FULLY-IMMERSIBLE. MEASUREMENT RANGE 0 TO 20.0 MG/L. PROBE TO PROVIDE ELECTROLYTE FREE OPERATION WITHOUT REQUIREMENTS OF SAMPLE CONDITIONING. FURNISH ONE PROBE WITH A S200 LAGOON TYPE PROBE FLOAT AND THE SECOND WITH A POLE TYPE MOUNTING HARDWARE SUITABLE FOR INSTALLATION IN A MANHOLE.
- .1 ACCEPTABLE PRODUCTS: PROBES WITH ALL CABLING AND CONNECTIONS, HACH LDO, YSI FDO, OR APPROVED EQUIVALENT.
  TRANSMITTER, HACH SC4500, YSI 284 OR APPROVED EQUIVALENT.

2.3 INSTRUMENTATION CABLING/WIRING

.1 24VDC INSTRUMENTATION SIGNAL AND DIGITAL CONTROL CABLES TO BE SINGLE OR MULTI-PAIRED (OR TRIAD), INDIVIDUALLY AND OVERALL SHIELDED, #16 GAUGE STRANDED COPPER CONDUCTORS, 600V, XLPE INSULATION, WITH OVERALL MOISTURE RESISTANT AND FIRE RETARDANT PVC JACKET. ARMOURED CABLES TO INCLUDE INTERLOCKING ALUMINUM ARMOUR (CSA TYPE ACIC).

.2 120VAC INSTRUMENTATION CONTROL CABLES TO BE MULTICONDUCTOR INDUSTRIAL CONTROL CABLE, #14 GAUGE INSULATED (XLPE) COPPER CONDUCTORS, 600V WITH OVERALL MOISTURE RESISTANT AND FIRE RETARDANT PVC JACKET. ALTERNATELY, CONTROL CABLES CAN BE SINGLE CONDUCTORS (STRANDED COPPER, #14 AWG, RW90, 600V) IN CONDUIT. ARMOURED CABLES TO BE TECK 90 TYPE CABLES.

.3 SUPPLY PATCH CORDS, CONNECTORS AND ADAPTERS AS REQUIRED TO MAKE COMPLETE FUNCTIONAL COMMUNICATIONS. PATCH CORD LENGTHS TO BE CONFIRMED ON SITE.

.4 HANDLE, INSTALL AND SUPPORT CABLES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

.5 GROUND SHIELDS FOR 24 VDC TWISTED PAIR AND TRIAD INSTRUMENTATION SIGNAL CABLES ON THE END SUPPLYING THE LOOP POWER, AND TAPED ON THE OPPOSITE END. SHIELD GROUNDS TO BE CONTINUOUS THROUGH ANY INTERMEDIATE FIELD JUNCTION BOXES (INDIVIDUALLY TERMINATED).

.6 GROUND 120 VAC MULTICONDUCTOR INDUSTRIAL CONTROL CABLE ON BOTH ENDS. WHEN RUN THROUGH INTERMEDIATE JUNCTION BOXES, BRING 120 VAC CABLE GROUNDS TO A COMMON JUNCTION BOX GROUND BAR, AND CONNECT TO EARTH GROUND VIA THE JUNCTION BOX GROUND.

.7 SUPPLY COMPLETE CONDUIT SYSTEM INCLUDING JUNCTION BOXES, COVERS, CONDUITS, FITTINGS AND MISCELLANEOUS HARDWARE TO CONSTITUTE A COMPLETE SYSTEM.

.8 IN WET LOCATIONS AND OUTSIDE, CABLES AND CONDUITS ARE TO ENTER FIELD INSTRUMENTS, CONTROL PANELS AND JUNCTION BOXES FROM THE BOTTOM ONLY. USE GROUNDING BUSHINGS WHEN TERMINATING IN NON-CONDUCTIVE BOXES OR PLATES.

.9 SUPPLY AND INSTALL CONTROL AND INSTRUMENTATION WIRING IN CONDUITS.

.10 INSIDE INSTRUMENTS, CONTROL PANELS, AND TERMINATION JUNCTION BOXES, IDENTIFY WIRE CONDUCTORS USING WIRE MARKERS (WEIDMULLER PT TRANSPARENT SLEEVES WITH TM-I LABELS, OR APPROVED EQUIVALENT). MARK CONDUCTORS TO BE MARKED WITH THEIR CORRESPONDING INSTRUMENT TAG NUMBER AND INSTRUMENT TERMINAL BLOCK NUMBER (EX: HS3004/C, WHERE HS3004 IS THE INSTRUMENT TAG NUMBER, AND "C" IS THE INSTRUMENT TERMINAL BLOCK NUMBER THE CONDUCTOR IS TERMINATED ON). THIS "CONDUCTOR IDENTIFIER" MUST REMAIN THE SAME THROUGH ANY INTERMEDIATE JUNCTION BOXES, ETC.

.11 CLEARLY IDENTIFY EACH CABLE AT BOTH ENDS WITH ITS CABLE NUMBER USING FLEXIBLE PVC SLIP-ON WIRE MARKERS ON A CARRIER STRIP AND FASTENED TO THE CABLE USING CHEMICAL RESISTANT TY-RAPS (ELECTROVERT K-MARKERS, OR APPROVED EQUIVALENT). LABELING MUST BE DONE AT CABLE TERMINAL POINTS.

.12 LEAVE CONDUCTORS BEING TERMINATED WITHIN A JUNCTION BOX/CONTROL PANEL LONG ENOUGH TO BE REMOVED FROM ITS ASSIGNED TERMINAL BLOCK AND REASSIGNED TO ANYWHERE WITHIN THE JUNCTION BOX/CONTROL PANEL.

.13 COIL TOGETHER SPARE CONDUCTORS OF A CABLE INSIDE ITS ASSOCIATED JUNCTION BOX/CONTROL PANEL AND CLEARLY IDENTIFIED WITH THE CABLE NUMBER (EX: SPARE-JB3000), UNLESS INDICATED TO BE TERMINATED ON SPARE TERMINALS. LEAVE ADEQUATE LENGTH TO RUN THE SPARE CONDUCTORS ANYWHERE WITHIN THE JUNCTION BOX/CONTROL PANEL. TERMINATE SPARE CONDUCTORS WHERE IDENTIFIED.

.14 FIT STRANDED CONDUCTORS WITH VINYL INSULATED WIRE END FERRULES WHEN TERMINATING TO TERMINAL BLOCKS, AND VINYL INSULATED LOCKING FORK TERMINAL CONNECTORS WHEN TERMINATING TO SCREW TERMINALS.

.15 USE CABLES RATED FOR THE REQUIRED HAZARDOUS AREA CLASSIFICATION.

3.0 EXECUTION

3.1 INSTALLATION

.1 INSTALL INSTRUMENTATION, SIGNAL AND CONTROL WIRES/CABLES IN CONDUIT SYSTEM. ARMOURED CABLES ARE PERMITTED IN THE BLOWER BUILDING AND OUTSIDE.

.2 EXECUTE WORK IN A PROFESSIONAL MANNER AND PRESENT A NEAT APPEARANCE WHEN COMPLETED.

.3 INSTALL INSTRUMENTATION AND CONTROL EQUIPMENT WHERE AND AS INDICATED ON THE DRAWINGS, AND IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. MANUFACTURER'S INSTALLATION INSTRUCTIONS MUST BE STRICTLY ADHERED TO.

.4 THE DRAWINGS INDICATE THE EXTENT AND GENERAL ARRANGEMENT OF THE ELECTRICAL SYSTEM. EXACT INSTALLATION LOCATIONS, DISTANCES AND LEVELS WILL BE GOVERNED BY ACTUAL FIELD CONDITIONS AND ARE SUBJECT TO APPROVAL BY THE CONSULTANT; FIELD VERIFICATION OF DIMENSIONS BY THE CONTRACTOR IS OBLIGATORY.

.5 IF ANY DEPARTURES FROM THE ORIGINAL INTENT OF THE DRAWINGS AND/OR THE SPECIFICATIONS ARE DEEMED NECESSARY BY THE SUPPLIER DETAILS OF SUCH DEPARTURES WITH DRAWINGS IS NECESSARY, TOGETHER WITH REASONS FOR THE DEPARTURE ARE TO BE SUBMITTED TO THE CONSULTANT AS SOON AS PRACTICAL FOR APPROVAL. NO SUCH DEPARTURE WILL BE MADE WITHOUT PRIOR WRITTEN CONSENT OF THE CONSULTANT.

.6 FABRICATE AND ERECT REQUIRED SUPPORT BRACKETS OR MOUNTING BRACKETS AS REQUIRED. PURCHASE INSTRUMENTS WITH ALL NECESSARY MOUNTING BRACKETS FROM THE INSTRUMENT VENDOR.

.7 LOCATE INSTRUMENTS TO MINIMIZE THE POSSIBILITY OF DAMAGE FROM HIGH TEMPERATURE, VIBRATION OR HUMIDITY, AND SHALL NOT INTERFERE WITH, OR BE DAMAGED BY, MAINTENANCE OF OTHER EQUIPMENT. INSTRUMENT INSTALLATION MUST ALSO PROVIDE FOR EASY ACCESSIBILITY FOR OPERATION, INSPECTION, AND MAINTENANCE PURPOSES.

.8 STORE MATERIALS IN A MANNER AS TO ENSURE THE PRESERVATION OF THEIR QUALITY AND FITNESS FOR THE WORK, AND TO FACILITATE INSPECTION BY THE CONSULTANT AND OWNER AT ANY TIME. KEEP INSTRUMENTS AND EQUIPMENT CLEAN AND PROTECTED AGAINST DAMAGES, DIRT, AND MOISTURE.

.9 PROTECT INSTALLED EQUIPMENT AGAINST WATER OR DIRT UNTIL IT IS COMMISSIONED. USE CLEAR PLASTIC SHEETING OF NOT LESS THAN 8-MIL THICKNESS FOR THIS PURPOSE.

.10 COORDINATE EQUIPMENT DELIVERY, STORAGE AND INSTALLATION REQUIREMENTS WITH OTHER TRADES ON SITE.

.11 REPAIR/REPLACE EQUIPMENT DAMAGED DURING CONSTRUCTION, OR OTHERWISE DEEMED DEFECTIVE OR NON-COMPLIANT WITH THIS SPECIFICATION.

3.2 TESTING AND CALIBRATION EQUIPMENT

.1 ENSURE TEST AND CALIBRATION EQUIPMENT USED BY THE SUPPLIER IS CALIBRATED TO AN INDUSTRY RECOGNIZED STANDARD AND AFFIX PROOF OF CALIBRATION ALONG WITH DATE OF NEXT CALIBRATION.

3.3 TESTING AND CHECK-OUT

.1 CONDUCT ALL TESTS NECESSARY TO CONFIRM THAT THE MATERIAL AND WORKMANSHIP ARE OF THE REQUIRED DEGREE OF EXCELLENCE, AND THAT THE SUPPLIED EQUIPMENT WILL PERFORM AS SPECIFIED.

.2 CALIBRATE INSTRUMENTS BEFORE INSTALLATION. SECURE THE SERVICES OF QUALIFIED PERSONNEL (MANUFACTURER'S REPRESENTATIVE) AND EQUIPMENT TO CONDUCT FIELD INSTRUMENT CALIBRATION.

.3 DOCUMENT THE RESULTS OF ALL TESTS/CALIBRATIONS, SUBMIT TO THE CONSULTANT AND INCLUDE IN THE PROJECT "OPERATIONS AND MAINTENANCE MANUAL" SUBMISSION.

3.4 COMMISSIONING AND START-UP

.1 ARRANGE AND PAY FOR THE SERVICES OF A MANUFACTURER'S FACTORY SERVICE REPRESENTATIVE TO SUPERVISE THE INSTALLATION, START-UP, CHECK, ADJUST, BALANCE AND CALIBRATE SUPPLIED INSTRUMENTATION AND CONTROLS EQUIPMENT. PROVIDE THESE SERVICES FOR SUCH PERIOD, AND FOR AS MANY VISITS AS NECESSARY TO PUT THE INSTALLATION IN WORKING ORDER, AND TO ENSURE THAT THE OPERATING PERSONNEL ARE CONVERSANT WITH ALL ASPECTS OF EQUIPMENT AND OPERATION.

.2 SUBMIT A WRITTEN REPORT SIGNED BY THE MANUFACTURER'S REPRESENTATIVE TO THE CONSULTANT STATING THE FOLLOWING:
- .1 THAT A SATISFACTORY INSTALLATION OF THE EQUIPMENT HAS BEEN PERFORMED OUTLINING MODIFICATIONS THAT HAVE BEEN MADE AS A RESULT OF TESTING THE EQUIPMENT; AND
- .2 THAT THE OPERATIONS AND MAINTENANCE INSTRUCTIONS FOR THE EQUIPMENT HAVE BEEN PRESENTED TO THE CONSULTANT AND OWNER.

.3 AFTER INSTRUMENTS AND CONTROLS EQUIPMENT HAVE BEEN INSTALLED, CALIBRATED, CHECKED OUT AND TESTED THE SYSTEM PLC/RTU/HMI SYSTEM TESTING/ COMMISSIONING CAN BEGIN. THIS WORK INVOLVES A POINT-BY-POINT CHECK FOR PLC/RTU/HMI SYSTEM MONITORED FIELD I/O POINTS, LOGIC CHECKS, COMMUNICATION CHECKS, COMPLETE CONTROLS INTEGRATION, AND EQUIPMENT START-UPS. PROVIDE TECHNICAL PERSONNEL DURING THIS PHASE OF THE WORK UNTIL THE INTEGRATION IS COMPLETE.

.4 DEVELOP AND PROVIDE A COMMISSIONING SCHEDULE TO THE CONSULTANT AND OWNER FOR APPROVAL.

SCREW BLOWER:

1.0 GENERAL

1.1 WORK INCLUDED

.1 THIS SPECIFICATION DESCRIBES THE REQUIREMENTS FOR DESIGN, SUPPLY, DELIVERY, TESTING AND COMMISSIONING FOR AERATION BLOWERS.

1.2 INTENT

.1 THE INTENT OF THESE SPECIFICATIONS IS TO PROVIDE THE WORKS FULLY COMPLETE IN EVERY DETAIL FOR THE PURPOSE DESIGNATED. FURNISH ANY APPARATUS, APPLIANCE, MATERIAL OR LABOUR NOT HEREIN SPECIFICALLY MENTIONED OR INCLUDED BUT REQUISITE TO THE OPERATION OF THE APPARATUS AND EQUIPMENT SPECIFIED WITHOUT ADDITIONAL EXPENSE TO THE CONTRACT.

1.3 DESIGN REQUIREMENTS

.1 DESIGN CONDITIONS:
- .1 UNIT FLOW CONDITIONS AT 100% RATED FLOW.
  - .1 CAPACITY: 99.9 M^3/MIN (STANDARD CONDITIONS OF 20°C, 101.3 kPA, 36% RH).
  - .2 DISCHARGE PRESSURE: 60.0 kPA (GAUGE).
- .2 UNIT FLOW CONDITIONS – SUMMER.
  - .1 CAPACITY: 87.0 M^3/MIN.
  - .2 DISCHARGE PRESSURE: 52.4 kPA (GAUGE).
- .3 UNIT FLOW CONDITIONS – WINTER.
  - .1 CAPACITY: 36.0 M^3/MIN.
  - .2 DISCHARGE PRESSURE: 52.4 kPA (GAUGE)
- .4 BLOWERS SHALL OPERATE AT RATED CONDITIONS:
  - .1 WITHOUT SURGING.
  - .2 WITHOUT OPERATING IN THE SERVICE FACTOR AREA.
- .5 INLET AIR CONDITIONS:
  - .1 BLOWERS MOUNTED AT 10M ABOVE SEA LEVEL (APPROXIMATE).
  - .2 MAXIMUM INLET AIR TEMPERATURE: +30°C.
  - .3 MINIMUM INLET AIR TEMPERATURE: -25°C.
  - .4 TOLERANCE FOR AIR FLOW RATE SHALL BE +5% AND -0% ABOVE AND BELOW RATED DISCHARGE CRITERIA.
  - .5 THE DESIGN OBJECTIVE IS THAT THE MAXIMUM SOUND PRESSURE LEVELS FOR THE UNIT (WITH SOUND ENCLOSURE) IS TO BE 85 DB(A) AS MEASURED AT 1.0 M FROM ANY SURFACE OF THE UNIT.

1.4 REFERENCES STANDARDS AND CODES

.1 THE WORK UNDER THIS SECTION MUST CONFORM TO THE APPLICABLE REQUIREMENTS OF THE HYDRAULIC INSTITUTE STANDARDS, NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA) AND REFERENCED STANDARDS THROUGHOUT THESE SPECIFICATIONS OF THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), CANADIAN STANDARDS ASSOCIATION (CSA), CANADIAN GENERAL STANDARDS BOARD (CGSB), AND AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).

1.5 QUALIFICATIONS OF EQUIPMENT MANUFACTURERS

.1 ALL ITEMS OF EQUIPMENT SUPPLIED MUST BE PRODUCED BY COMPANIES REGULARLY ENGAGED IN MANUFACTURING THIS TYPE OF EQUIPMENT AND WHO MAINTAIN SERVICE AND PARTS DEPARTMENTS FROM WHICH SERVICE, REPAIRS AND REPLACEMENTS MAY BE OBTAINED QUICKLY AT ALL TIMES. MECHANICAL DETAILS OF THE EQUIPMENT OFFERED MUST HAVE BEEN TRIED AND TESTED BY THE ACTUAL CONSTRUCTION AND OPERATION OF MECHANISMS OF THE EXACT TYPE AND OF COMPARABLE SIZE AND OPERATING IN SIMILAR SERVICE.

1.6 IDENTIFICATION OF EQUIPMENT

.1 FIT PROCESS EQUIPMENT WITH THE MANUFACTURER'S IDENTIFICATION NAMEPLATES INDICATING SIZE, EQUIPMENT MODEL, MANUFACTURER'S NAME, SERIAL NUMBER, VOLTAGE, CYCLE, PHASE AND POWER OF MOTORS, ALL FACTORY SUPPLIED.

1.7 OPERATION AND MAINTENANCE MANUALS

.1 PROVIDE OPERATION AND MAINTENANCE MANUALS.

.2 PROVIDE THE FOLLOWING INFORMATION AS A MINIMUM:
- .1 BLOWER OUTLINE DRAWINGS SHOWING THE DIMENSIONS AND WEIGHT OF THE BLOWER PACKAGE, INCLUDING CONNECTION LOCATIONS, SIZES AND ANY PIPING LOAD LIMITS. ALSO SHOW CENTER OF GRAVITY, MAINTENANCE SIZES AND WEIGHT OF HEAVIEST MAINTENANCE ITEM ALONG WITH MAINTENANCE REMOVAL DISTANCES. ALSO INCLUDE NOTES REGARDING CUSTOMER'S PIPING, LIFTING, ETC.
- .2 PROCESS AND INSTRUMENTATION DIAGRAMS, SHOWING LEGEND, LUBE OIL SCHEMATIC, PROCESS SCHEMATIC, INSTRUMENTATION WITH ALARMS AND SHUTDOWN, SETPOINT AND INTERLOCKS SHOWN USING LOGIC BLOCKS.
- .3 ELECTRICAL SCHEMATIC DESIGNED TO SHOW A COMPLETE LOOP OF EACH CIRCUIT WITH TERMINATION POINTS INCLUDED, THREE WIRE DIAGRAM OF THE POWER DISTRIBUTION SYSTEM, DIAGRAM FOR INSTRUMENTATION ETC.
- .4 WIRING DIAGRAM DESIGNED TO SHOW THE DETAILED ELECTRICAL ARRANGEMENT DRAWINGS FOR ELECTRICAL EQUIPMENT FURNISHED.
- .5 IF ANY LOOSE ACCESSORY EQUIPMENT IS BEING SUPPLIED, THEN OUTLINE DRAWINGS OF THE LOOSE SHIPPED ACCESSORIES SHALL BE PROVIDED.
- .6 PROVIDE OPERATIONS AND MAINTENANCE MANUAL AS PER THE MANUFACTURER'S FORMAT, INCLUDING:
  - .1 PREFACE – SAFETY PRECAUTIONS, RECEIVING AND STORAGE, WARRANTY LIMIT OF LIABILITY, STANDARD PREVENTATIVE MAINTENANCE AGREEMENTS, AND REVISIONS.
  - .2 GENERAL BLOWER DESCRIPTION
  - .3 INSTALLATION
  - .4 LUBRICATION SYSTEM
  - .5 UNIT CONTROLLER WITH AS-COMMISSIONED SETPOINTS
  - .6 OPERATION
  - .7 MAINTENANCE
  - .8 RECOMMENDED SPARE PARTS
  - .9 DRAWINGS
  - .10 COMPONENT LITERATURE
  - .11 ADDITIONAL SPECIFICATIONS AND PROCEDURES
- .7 BLOWER & MOTOR TEST: SUBMIT THE GENERAL SCHEDULE, TEST SETUP AND PREPARATION, MECHANICAL TEST RUN, PERFORMANCE TEST RUN WITH TEST CONDITIONS, DOCUMENTATION, ACCEPTANCE CRITERIA FOR TEST RUN, OIL SYSTEM PARAMETERS, VISUAL INSPECTION, AND FINAL DOCUMENTATION.
- .8 UNLOADING, HANDLING, STORAGE & MAINTENANCE REQUIREMENTS.
- .9 SURFACE PREPARATION & SHOP PAINT SPECIFICATIONS.

1.8 SHOP DRAWINGS

.1 SUBMIT SHOP DRAWINGS FOR BLOWER EQUIPMENT AND RELEVANT OPERATING DATA.

.2 SUBMIT SHOP DRAWINGS FOR AN INTEGRAL SOUND ENCLOSURE. INCLUDE RELEVANT DATA ON SOUND REDUCTIONS BY ENCLOSURE FOR OCTAVE BAND ANALYSIS.

1.9 SPARE PARTS

.1 ONE (1) SET OF AIR & OIL FILTER REPLACEMENTS (PER UNIT)

.2 BLOWER OIL

.3 ANY SPECIAL TOOLS REQUIRED FOR ROUTINE MAINTENANCE.

1.10 WARRANTY

.1 PROVIDE A GUARANTEE IN WRITING THAT EXPRESSLY STATES THE UNITS WILL BE FREE OF DEFECTS FOR A PERIOD OF AT LEAST ONE (1) YEAR FROM THE DATE OF INITIAL OPERATION.

2.0 PRODUCTS

2.1 GENERAL

.1 THE AERATION BLOWERS WILL BE USED TO PROVIDE LOW PRESSURE AIR TO AN AERATION SYSTEM WHICH PROVIDES OXYGEN AND MIXING TO A SUSPENDED GROWTH BIOLOGICAL PROCESS. THE AERATION DIFFUSERS WILL BE MOUNTED IN A LAGOON WITH A DEPTH OF 4.4 M. EACH BLOWER WILL DRAW AIR FROM THE OUTDOORS THROUGH A ROOF LOCATED WEATHERHOOD/AIR FILTER INTAKE. THE OPERATING BLOWERS DISCHARGE TO A COMMON HEADER WHICH DISTRIBUTES AIR TO THE AERATION SYSTEM. AIR IS DISTRIBUTED TO A SYSTEM OF FOUR (4) DISTRIBUTION PIPES TO THE FOUR (4) LAGOON CELLS. PROVIDE TWO (2) UNITS COMPLETE WITH NEW EXTERIOR FLANGED WEATHERHOODS WITH WIRE MESH. TO MINIMIZE POWER USAGE, THE BLOWERS WILL BE CONTROLLED BY INTEGRAL VARIABLE FREQUENCY DRIVES. A MINIMUM UNIT TURNDOWN OF 65% (OF MAXIMUM DUTY) IS DESIRABLE.

.2 SCREW/HYBRID BLOWER SYSTEM: TWO (2) SCREW OR HYBRID AIR BLOWER ASSEMBLIES COMPLETE WITH DYNAMICALLY BALANCED BLOWER, FLEXIBLE CONNECTIONS, COUPLING AND DRIVE MOTOR MOUNTED ON A COMMON BASEPLATE WITH GUARDS AND INCLUDING AN INLET SILENCER, INTEGRAL CHECK VALVE AND ACOUSTIC ENCLOSURE.

.3 ALL COMPONENTS MUST BE NEW AND BOTH WORKMANSHIP AND MATERIALS MUST BE ENTIRELY SUITABLE FOR THE SERVICE AS DEFINED IN THE SPECIFICATION AND SHALL CONFORM TO ALL APPLICABLE SECTIONS OF THESE SPECIFICATIONS. COMPONENTS SPECIFIED MUST BE UNDERSTOOD TO ESTABLISH MINIMUM REQUIREMENTS ONLY, AND DO NOT RELIEVE THE RESPONSIBILITY FOR PROVIDING A PROPERLY FUNCTIONING SYSTEM.

.4 BLOWER(S) TO BE VARIABLE SPEED ELECTRIC MOTOR DRIVEN, SINGLE-STAGE, AIR COOLED POSITIVE DISPLACEMENT ROTARY SCREW OR HYBRID SCREW TYPE COMPLETE WITH INTEGRAL GEARBOX AND ACCESSORIES AS DESCRIBED.

.5 BLOWERS OF A DESIGN REQUIRING SYNCHRONIZATION OF AIR FLOW IN ORDER THAT TWO OR MORE MAY OPERATE IN PARALLEL SHALL BE ACCEPTABLE, THAT IS, THE BLOWERS SHALL OPERATE IN A CASCADE, OR PARALLEL MODE, BASED UPON THE VENDOR'S RECOMMENDATION.

.6 POSITIVE DISPLACEMENT SCREW BLOWERS TO BE AIR-COOLED, SINGLE-STAGE, VARIABLE FREQUENCY DRIVE ELECTRIC MOTOR-DRIVEN AND MUST BE CERTIFIED ISO 8573-1 CLASS 0 FOR AIR PURITY. THE BLOWER SHALL MATCH THE AIR DEMAND BY CONTINUOUSLY CHANGING THE SPEED OF THE DRIVE MOTOR TO ENSURE THE AIRFLOW DEMAND IS MAINTAINED.
- .1 BLOWER TO INCLUDE:
  - .1 BASE FRAME & ACOUSTIC ENCLOSURE
  - .2 AIR INLET FILTER
  - .3 BLOWER ELEMENT
  - .4 COMPENSATOR
  - .5 START-UP & BLOW OFF VALVE
  - .6 CHECK VALVE
  - .7 PULSATION DAMPER
  - .8 OIL SYSTEM
  - .9 DRIVE MOTOR WITH INTEGRATED GEAR BOX
  - .10 INTEGRATED VARIABLE FREQUENCY DRIVE (VFD)
  - .11 INTEGRATED MICROPROCESSOR BASED UNIT CONTROLLER
  - .12 INTEGRATED INSTRUMENTATION

2.2 BASE FRAME AND ACOUSTIC ENCLOSURE

.1 MOUNT THE BLOWER ON A STURDY INDUSTRIAL GRADE STEEL BASE FRAME WITH FORKLIFT SLOTS ALLOWING THE UNIT TO BE PLACED ON A LEVEL FLOOR CAPABLE OF SUPPORTING THE WEIGHT OF THE UNIT. BASE FRAME COMPETE WITH ANCHOR POINTS TO FIX THE POSITION.

.2 MOUNT THE COMPLETE ASSEMBLED BLOWER / GEARBOX / MOTOR UNIT WITH VIBRATION DAMPERS IN A SHEET METAL ACOUSTIC ENCLOSURE WHICH INCORPORATED AIR INLET BAFFLING TO REDUCE THE SOUND LEVEL UNDER 80DB(A). AIR INLET TO BE FLANGED FOR AN EXTERNAL AIR SUPPLY.

.3 ALL SERVICE POINTS TO THE BLOWER MUST BE EASILY ACCESSIBLE VIA THE USE OF LARGE DOOR PANELS THAT ARE EASILY MOUNTED / DISMOUNTED. THE ACOUSTIC ENCLOSURE DOOR PANELS MUST BE SELF-ALIGNING.

.4 THE ENCLOSURE MUST BE STRENGTHENED WITH PROPER SUPPORT STRUCTURE TO ELIMINATE ANY DAMAGE DURING TRANSPORT OR DURING OPERATION.

2.3 AIR INLET FILTER

.1 MOUNT THE AIR INLET FILTER WITHIN THE ACOUSTIC ENCLOSURE WITH SUFFICIENT ACCESS. INTERNAL AIR FILTER MUST BE DRY PAPER FILTER WITH HIGH FILTRATION EFFICIENCY:
- .1 SAE COURSE – 0.999
- .2 SAE FINE – 0.995

.2 PROVIDE A FILTER DESIGNED TO PROVIDE SUFFICIENT SURFACE AREA TO ENSURE LOW PRESSURE DROP (ΔP=0.15-0.30 PSI) ACROSS THE INLET FILTER IN CLEAN CONDITION.

2.4 BLOWER ELEMENT

.1 BLOWER COMPRESSION TO BE COMPRISED OF TWO (2) HELICOIDAL ROTORS TURNING INTO EACH OTHER.

.2 ROTORS TO BE MADE OF CAST IRON, GRADE GGG40 OR EQUIVALENT, MACHINED, COATED WITH TEFLON AND TEFLON GRAPHITE AND BAKED.

.3 CASING MUST BE FINNED AND MADE OF CAST IRON GRADE GG20 OR EQUIVALENT.

.4 THE INTERMESHING TIMING GEARS WILL ALLOW FOR NO CONTACT TO OCCUR BETWEEN LOBES AND MAINTAIN THE REQUISITE CLEARANCE BETWEEN THE ROTORS AND ENSURE WEAR AND TEAR IS ELIMINATED AND NO LUBRICATION IS REQUIRED IN THE COMPRESSION SPACE. TIMING GEARS TO BE OF THE SPUR TYPE, QUALITY DIN CLASS 6 OR EQUIVALENT AND MADE OF ALLOY STEEL 20 MNCR5, CASE HARDENED.

.5 INSTALL AIR SEALS ON THE BLOWER COMPRESSION ELEMENT SHAFT TO PREVENT AIR ESCAPING ALONG THE ROTOR SHAFT, WHILE A SEPARATE TIN BRONZE THREADED VISCO-SEAL SHALL BE USED TO STOP OIL ESCAPING FROM THE ROTOR BEARINGS INTO THE COMPRESSION CHAMBER. THE SEALING ASSEMBLY MUST CONFORM TO ISO 8573-1 CLASS 0 CERTIFICATION AND PRODUCE 100% OIL-FREE AIR.

2.5 COMPENSATOR

.1 INSTALL A STAINLESS STEEL COMPENSATOR AT THE BLOWER ELEMENT DISCHARGE TO ENSURE VIBRATIONS FROM THE DOWNSTREAM PIPING ARE NOT TRANSMITTED TO THE BLOWER COMPRESSION ELEMENT AND VICE VERSA.

2.6 START-UP BLOW OFF VALVE

.1 WHEN THE BLOWER IS TURNED OFF, THE START-UP BLOW OFF VALVE MUST REMAIN OPEN TO ENSURE THE BLOWER RESTARTS IN AN UNLOADED CONDITION. ONCE THE BLOWER IS STARTED AND STARTS GENERATING AIR, THE VALVE WILL CLOSE AND ALLOW AIR TO FLOW THROUGH TO THE PROCESS. IN THE CASE THE SYSTEM PRESSURE REACHES THE BLOW-OFF POINT, THE VALVE WILL OPEN TO REDUCE THE PRESSURE.

.2 OPENING AND CLOSING OF THE START-UP/BLOW OFF VALVE TO BE THROUGH A SOLENOID THAT IS OPERATED BY UNIT CONTROLLER BASED ON INPUTS FROM THE INTEGRAL PRESSURE TRANSDUCER INSTALLED AT THE BLOWER DISCHARGE HOUSED WITHIN THE BLOWER ENCLOSURE.

2.7 CHECK VALVE

.1 CHECK VALVE TO BE DISC TYPE DN250 OR LARGER WITH METAL TO METAL SEATING AND NO RUBBER COMPONENTS IN THE AIR PASSAGE. SUITABLE FOR TEMPERATURES OF +285°F.

.2 INTEGRATE THE CHECK VALVE WITH THE BLOWER PACKAGE AND MOUNT INTERNAL TO THE BLOWER ENCLOSURE.

2.8 PULSATION DAMPER

.1 A CARBON STEEL PULSATION DAMPER OF SIZE DN350 OR LARGER MUST BE BUILT-IN AND CONNECTED TO THE AIR DISCHARGE FROM THE BLOWER COMPRESSION ELEMENT.

.2 MAXIMUM WORKING PRESSURE OF THIS PULSATION DAMPER TO BE MINIMUM 18PSIG. SUITABLE FOR TEMPERATURES FROM +15 TO +320°F.

.3 NOISE ABSORPTION MATERIAL TO BE STAINLESS STEEL WOOL AND AVERAGE SOUND ATTENUATION MUST BE MINIMUM 30DB(A).

2.9 OIL SYSTEM

.1 BLOWER TO HAVE A COMPLETE OIL SYSTEM COMPRISING OF THE FOLLOWING:
- .1 OIL SUMP
- .2 OIL BREATHER
- .3 OIL PUMP
- .4 AIR COOLED OIL COOLER
- .5 OIL FILTER
- .6 INSTRUMENTATION (PRESSURE & TEMPERATURE)

.2 OIL IS CIRCULATED BY PUMP FROM THE OIL RESERVOIR THROUGH THE OIL COOLER, OIL FILTER AND OIL MANIFOLD TO THE COMPRESSOR ELEMENT GEAR BOX.

.3 A BY-PASS VALVE WILL OPEN IF THE OIL PRESSURE RISES ABOVE A SET VALUE.

.4 OIL SYSTEM TO MAINTAIN THE OIL TEMPERATURE AT AMBIENT PLUS MAXIMUM 68°F.

2.10 BLOWER DRIVE AND GEAR BOX

.1 PROVIDE EACH BLOWER WITH A HORIZONTAL, VARIABLE SPEED INVERTER DUTY TOTALLY ENCLOSED FAN COOLED (TEFC) SQUIRREL CAGE INDUCTION MOTOR.

.2 PROVIDE MOTOR DESIGNED IN ACCORDANCE WITH PREVAILING IEC / NEMA STANDARDS. MOTOR TO HAVE A MINIMUM 1.15 SERVICE FACTOR. INSULATION TO BE CLASS "F" INSULATION WITH A CLASS "B" TEMPERATURE RISE ABOVE 40°C (105°F).

.3 ONLY SUPPLY SIEMENS, WEG OR AFF MOTORS WITH THE BLOWERS.

.4 MOTORS TO BE OF PREMIUM EFFICIENCY DESIGN. EFFICIENCIES WILL BE DETERMINED IN ACCORDANCE WITH IEC/NEMA STANDARD. INCLUDE NOMINAL AND GUARANTEED EFFICIENCIES ON MOTOR NAMEPLATES IN COMPLIANCE WITH IEC/NEMA STANDARD.

.5 THE PACKAGE MUST BE SUITABLE FOR OPERATION ON 600V VOLT (+/- 10%), 3 PHASE, AND 60HZ POWER FOR AMBIENT AIR TEMPERATURE OF UP TO 120°F. MOTORS MUST BE SUITABLE FOR FULL VOLTAGE & REDUCED VOLTAGE SOFT START (INVERTER DUTY).

.6 MOTORS TO HAVE FACTORY INSTALLED FAIL-SAFE WINDING PROTECTION IN EACH PHASE. CONNECT WINDING TEMPERATURE SENSORS TO THE UNIT CONTROLLER FOR MONITORING AND ALARM.

.7 MOTOR AND THE GEAR BOX TO BE OF AN INTEGRATED TYPE.

.8 BEARINGS TO BE FROM SKF OR EQUIVALENT AND SELECTED FOR WORST CASE CONDITIONS, I.E. MAXIMUM PEAK TORQUE TRANSMISSION, MAXIMUM TEMPERATURE, INCLUDING VIBRATION LEVELS (UP TO .30 IN/SEC.). THE L10 LIFETIME AT MAX. DYNAMIC LOAD (INCLUDING VIBRATIONS) AND AT MAX. TEMPERATURE TO BE OVER 400,000 HOURS.

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NO:	REVISIONS	DATE YYYY/MM/DD	INIT.
0	ISSUED FOR TENDER	2022/10/7	DA
A	ISSUED FOR 99% REVIEW	2022/07/20	DA

PROJECT TITLE:
LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

DRAWING TITLE:
PROCESS SPECIFICATION PAGE 1 OF 2

SCALE: AS NOTED	DATE: APRIL, 2022
DRAWN BY: D. ABREY	DRAWING NO: P03
CHECKED BY: M. ABBOTT	

Sheet Size: B1

2.0 PRODUCTS (CONTINUED)

2.10 BLOWER DRIVE AND GEAR BOX (CONTINUED)

.9 GEARS TO BE HIGH PRECISION GEARS (DIN3961/CLASS 6) AND MATERIAL QUALITY CERTIFIED ACCORDING TO ISO6336-S-ML TO THE PERFORMANCE OF THE TRANSMISSION AND THE TRANSMISSION LOSSES REDUCED AS MUCH AS POSSIBLE.

2.11 VARIABLE FREQUENCY DRIVE

.1 THE VARIABLE FREQUENCY DRIVE (VFD) MUST BE INTEGRATED INTO THE BLOWER PACKAGE AND INSTALLED ON THE SAME BASE FRAME AS THE BLOWER ASSEMBLY.

.2 SUPPLY THE VFD FROM THE SAME SUPPLIER AS THE MOTOR AND ONLY SIEMENS, WEG OR ABB MOTORS AND VFD DRIVES ARE ACCEPTABLE.

.3 VFD DRIVES TO INCORPORATE THE LATEST GENERATION OF POWER TRANSISTORS (IGBT'S). DRIVES TO BE BASED SOPHISTICATED VECTOR TECHNOLOGY AND MUST HAVE OPTIMIZED TORQUE CONTROL THROUGHOUT ITS SPEED RANGE.

.4 VFD DRIVE TO HAVE THE ABILITY TO START UP AT BOTH LOW (15°F) AND HIGH TEMPERATURES (120°F), AVOID SHUTDOWNS AND ALLOW THE MOTOR TO RUN COOLER EVEN AT LOW SPEEDS.

.5 HAVE THE ENTIRE DRIVE PACKAGE INDEPENDENTLY CERTIFIED AND INCORPORATE SUITABLE RFI FILTERS TO ELIMINATE HARMONIC DISTORTIONS.

2.12 CONTROLLER

.1 THE BLOWER WILL BE CONTROLLED BY A MICROPROCESSOR CONTROLLER WHICH:
.1 CONTROLS THE OPERATION OF THE BLOWER.
.2 CONTROLS THE MOTOR SPEED (VARIABLE FREQUENCY DRIVE).
.3 REDUCES POWER CONSUMPTION BY STOPPING BLOWER WHEN NOT REQUIRED.
.4 WARNS THE OPERATOR IN CASE OF AN ABNORMAL OPERATING CONDITION.
.5 PROTECTS THE BLOWER.
.6 MONITORS COMPONENTS SUBJECT TO SERVICE.
.7 AUTOMATICALLY RESTARTS THE BLOWER AFTER VOLTAGE FAILURE.

.2 THE UNIT CONTROLLER MUST MATCH THE BLOWER AIR DELIVERY TO THE AIR CONSUMPTION KEEPING THE NET PRESSURE FLUCTUATIONS VERY LOW. THE UNIT CONTROLLER SHALL CONTINUOUSLY VARY THE MOTOR SPEED TO MAINTAIN THE AIR NET PRESSURE AS CLOSE AS POSSIBLE TO THE PROGRAMMED PRESSURE SET POINT OR THE REMOTE 4-20 mA DISSOLVED OXYGEN BASED SIGNAL FROM THE FACILITIES PLC.

.3 IF THE AIR CONSUMPTION DECREASES, THE UNIT CONTROLLER WILL DECREASE THE MOTOR SPEED AS WELL AS TO REDUCE POWER CONSUMPTION AND VICE VERSA.

.4 IF THE MOTOR IS RUNNING AT MINIMUM SPEED AND THE NET PRESSURE RISES TO A PROGRAMMED VALUE THE SOLENOID VALVE INSTALLED ON THE START-UP / BLOW-OFF VALVE WILL BE DE-ENERGIZED AND AIR RELEASED TO ATMOSPHERE THEREBY UNLOADING THE BLOWER.

.5 IF THE BLOWER REMAINS RUNNING UNLOADED UNINTERRUPTEDLY FOR 150 SECONDS, THE UNIT CONTROLLER WILL STOP THE MOTOR.

.6 THE UNIT CONTROLLER WILL PROTECT THE BLOWER AND SHUTDOWN THE BLOWER WHENEVER ONE OF THE MEASUREMENTS EXCEEDS THE PROGRAMMED SHUTDOWN LEVEL. THIS WILL BE INDICATED ON THE HMI SCREEN AND A VISUAL ALARM SHALL BE GENERATED.

.7 THE UNIT CONTROLLER WILL ALSO WARN THE OPERATOR BASED ON THE PRE-PROGRAMMED SERVICE WARNING, A NUMBER OF SERVICE OPERATIONS GROUPED AS LEVEL A, B, C ETC SHALL BE MADE AVAILABLE AND IF A TIME INTERVAL IS EXCEEDED, A MESSAGE SHALL APPEAR ON THE HMI SCREEN TO WARN THE OPERATOR TO CARRY OUT THE SERVICE ACTIONS BELONGING TO THAT LEVEL.

.8 THE FACILITIES CONTROL SYSTEM IS PLC BASED, AND MUST COMMUNICATE WITH THE INDIVIDUAL BLOWERS THROUGH DIGITAL AND ANALOG I/O. PROVIDE ETHERNET COMMUNICATIONS FOR FUTURE CONNECTION. THE FACILITIES CONTROL SYSTEM TO START/STOP, MONITOR, AND RELAY PROCESS INFORMATION TO/FROM THE SCADA SYSTEM, AS REQUIRED FOR THEIR INTEGRATION INTO THE OVERALL FACILITY CONTROLS STRATEGY. AS A MINIMUM MAKE THE FOLLOWING CONTROL PARAMETERS AVAILABLE FOR HARD WIRED CONNECTION TO/FROM THE FACILITY CONTROL SYSTEM:
.1 DIGITAL:
BLOWER RUNNING
BLOWER FAULTED
BLOWER IN-REMOTE
BLOWER START/STOP
.2 ANALOG:
BLOWER SPEED REQUEST
BLOWER CURRENT (AMPS)

.9 EQUIP THE CONTROL PANEL WITH A "LOCAL/REMOTE" SELECTOR SWITCH. WHEN "LOCAL" IS SELECTED, INDIVIDUAL BLOWERS CAN BE OPERATED LOCALLY FROM THE BLOWER'S OPERATOR INTERFACE. WHEN "REMOTE" IS SELECTED, THE SELECTION OF WHICH BLOWERS ARE DUTY OR STANDBY IS FROM THE FACILITY'S CONTROL SYSTEM.

.10 PROVIDE HAND/OFF/AUTO (H/O/A) SELECTOR FOR ALL EQUIPMENT SUPPLIED MOTORS. THIS MODE OF OPERATION WILL BE USED MAINLY FOR CLEARING EQUIPMENT TRIPS, AND FOR MAINTENANCE PURPOSES. WHEN "OFF" IS SELECTED, THE ASSOCIATED MOTOR CANNOT BE STARTED, OR WILL STOP IF IT IS RUNNING.

.11 UNIT CONTROLLER TO HAVE AN EMERGENCY STOP BUTTON SO THAT IN THE EVENT OF AN EMERGENCY, THIS BUTTON COULD BE USED TO STOP THE BLOWER IMMEDIATELY.

.12 SYSTEM TO HAVE THE ABILITY TO CHOOSE SPECIFIC UNITS FOR DISPLAY.

.13 UNIT CONTROLLER TO HAVE A PROVISION TO CALL UP THE FOLLOWING COUNTERS:
.1 THE RUNNING HOURS
.2 THE LOADED HOURS
.3 THE NUMBER OF MOTOR STARTS
.4 THE NUMBER OF HOURS THE REGULATOR (MODULE) HAS BEEN UNDER TENSION
.5 THE NUMBER OF LOAD CYCLES

.14 UNIT CONTROLLER TO ALSO HAVE A PROVISION TO PROGRAM:
.1 TIME-BASED START/STOP COMMANDS FOR THE BLOWER
.2 TIME-BASED CHANGE-OVER COMMANDS FOR THE NET PRESSURE BAND

.15 SYSTEM TO CALCULATE BLOWER OUTPUT BASED ON MOTOR CURRENT DRAW AND INLET AIR TEMPERATURE.

.16 UNIT CONTROLLER TO INCLUDE REMOTE SPEED CONTROL FOR OPERATOR MANAGEMENT FROM FACILTY PLC. THE SYSTEM MUST CONTROL OUTPUT SO THE BLOWERS DO NOT EXPERIENCE A SURGE CONDITION.

2.13 INSTRUMENTATION

.1 INCLUDE INTEGRATED, FACTORY INSTALLED AND WIRED INSTRUMENTATION (PRESSURE AND TEMPERATURE TRANSDUCERS) AS A MINIMUM TO DELIVER THE FOLLOWING PARAMETERS:
.1 COMPRESSOR OUTLET PRESSURE (WARNING) BAR(E) OR PSIG
.2 COMPRESSOR OUTLET PRESSURE (SHUT-DOWN) BAR(E) / PSIG
.3 OIL PRESSURE (SHUT-DOWN WARNING LEVEL) BAR(E) / PSIG
.4 OIL PRESSURE (SHUT-DOWN LEVEL) BAR(E) / PSIG
.5 BLOWER ELEMENT OUTLET TEMPERATURE (SHUT-DOWN WARNING LEVEL) DEG C / DEGF
.6 BLOWER ELEMENT OUTLET TEMPERATURE (SHUT-DOWN LEVEL) DEG C / DEG F
.7 OIL TEMPERATURE (SHUT-DOWN WARNING LEVEL) DEG C / DEG F
.8 OIL TEMPERATURE (SHUT-DOWN LEVEL) DEG C / DEG F.

2.14 ACCEPTABLE PRODUCT:
.1 ATLAS COPCO ZS5 VSD 110 OR APPROVED EQUIVALENT.

3.0 EXECUTION

3.1 DELIVERY

.1 SHIP EQUIPMENT TO THE SITE PRE-ASSEMBLED TOTHE EXTENT POSSIBLE.

3.2 INSPECTION

.1 PROVIDE SERVICE OF COMPETENT SERVICEPERSON, MECHANIC OR OTHER TRAINED PERSONNEL OF THE SUPPLIERS OR MANUFACTURERS TO CHECK THE COMPLETE INSTALLATION AND BE PRESENT FOR START-UP OF THE EQUIPMENT. SUBMIT A WRITTEN REPORT SIGNED BY THE EQUIPMENT MANUFACTURER'S REPRESENTATIVE TO THE CONSULTANT STATING THE FOLLOWING:
.1 THAT A SATISFACTORY INSTALLATION OF EQUIPMENT HAS BEEN PERFORMED AND OUTLINING ANY MODIFICATIONS THAT HAVE BEEN MADE AS A RESULT OF THE COMMISSIONING OR TESTING OF THE EQUIPMENT AT NO ADDITIONAL COST TO THE CONTRACT.
.2 THAT THE EQUIPMENT IS NOW READY FOR PERMANENT OPERATION.
.3 THAT THE OPERATION, LUBRICATION AND MAINTENANCE INSTRUCTIONS FOR THE EQUIPMENT HAVE BEEN PRESENTED TO THE OWNER, CONSULTANT AND OPERATORS.
.4 THAT THE EQUIPMENT HAS BEEN PROPERLY LUBRICATED WITH THE CORRECT LUBRICANTS.

.2 HAVE THE EQUIPMENT MANUFACTURER'S REPRESENTATIVE FULLY INSTRUCT THE PERMANENT OPERATORS OF THE EQUIPMENT IN THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AT NO ADDITIONAL COST TO THE CONTRACT.

.3 ASSUME A MINIMUM PERIOD OF FOUR (4) DAYS ON SITE FOR SKILLED SUPERVISION AND INSTRUCTION AND A MINIMUM OF TWO (2) TRIPS TO THE SITE. PROVIDE AS MANY TRIPS AND DAYS ON SITE AS REQUIRED TO COMPLETE THE INSTALLATION AND PUT THE EQUIPMENT INTO SATISFACTORY OPERATION.

3.3 TESTING

.1 EACH MAIN DRIVE MOTOR WILL BE GIVEN A ROUTINE NON-WITNESSED TEST IN ACCORDANCE WITH IEC / NEMA TEST PROCEDURES. FURNISH A CERTIFIED MOTOR DATA SHEET FOR APPROVAL PRIOR TO SHIPMENT

.2 TEST EACH BLOWER IN ACCORDANCE WITH THE ISO 1217 ED. 3 ANNEX C, STIPULATING THE FAD MEASUREMENT AT THE OUTLET OF THE PACKAGE, NET OF ALL LOSSES. CONDUCT PERFORMANCE TESTS AS A COMPLETE PACKAGED UNIT INCLUDING THE BLOWER, MOTOR, VARIABLE FREQUENCY DRIVE, SOUND ENCLOSURE, AND INSTRUMENTATION, ACCESSORIES AND UNIT CONTROLLER. ANY EXCEPTIONS REQUIRED MUST BE OUTLINED IN DETAIL AT THE TIME OF QUOTATION.

.3 TEST TO INCLUDE BLOWER PERFORMANCE (BOTH FLOW AND PRESSURE) OVER THE COMPLETE OPERATING RANGE FORM GIVEN MINIMUM MOTOR SPEED TO THE MAXIMUM SPEED OF THE MOTOR. ALSO, PACKAGE POWER CONSUMPTION WILL BE CONSIDERED DURING THE TEST WHICH WILL INCLUDE THE MAIN DRIVE MOTOR POWER, VARIABLE FREQUENCY DRIVE (VFD) LOSSES, INLET FILTER AND CHECK VALVE PRESSURE DROP LOSSES, OIL COOLER AND OIL PUMP.

.4 BLOWER NET DELIVERED FLOW RATE MUST BE GUARANTEED WITH NO NEGATIVE TOLERANCE AND THE DISCHARGE PRESSURE SHALL BE GUARANTEED WITH NO LOWER TOLERANCE OTHER THAN THOSE NOTED IN ISO 1217 ED.3 PROCEDURES.
.1 CAPACITY OF THE BLOWER TO BE DEFINED AS PER PARAGRAPH 5.6 OF THE ISO 1217 ED 3 ANNEX C OF THE TEST CODE. MEASURE THE DESIGN DISCHARGE PRESSURE ON THE DISCHARGE SIDE OF THE BLOWER AT THE DISCHARGE FLANGE.
.2 CALIBRATE ALL TEST EQUIPMENT AND HAVE CERTIFIED BY AN INDEPENDENT TEST AGENCY NO MORE THAN TWELVE (12) MONTHS PRIOR TO THE TEST DATE. CERTIFICATES TO SHOW THE STABILITY OF CALIBRATION OVER A PERIOD OF AT LEAST ONE YEAR.
.3 MEASURE THE POWER COMPUTATION AS QUOTED AT THE BLOWER DISCHARGE FLANGE. CALCULATE POWER AS PER PARAGRAPH 5.7 OF THE ISO 1217 ED 3 ANNEX C OF THE TEST CODE.
.4 PERFORM A FACTORY FUNCTIONAL OPERATIONAL CHECK ON EACH UNIT WITH ITS CONTROLLER.
.5 THE OWNER AND/OR CONSULTANT CAN WITNESS BLOWER PERFORMANCE TESTS. PROVIDE FOURTEEN (14) DAYS NOTICE, IN WRITING, FOR THE WITNESSED TESTS. THE OWNER WILL BE RESPONSIBLE FOR THEIR TRAVEL COSTS ASSOCIATED WITH WITNESS TESTING.
.6 BLOWER TEST REPORT TO PRESENT COMPUTATIONS IN EXACT ACCORDANCE WITH SECTION 5.6 & 5.7 OF ISO 1217 ED. 3 ANNEX C WITH PERFORMANCE CURVES SHOWING FLOW, PRESSURE AND POWER INPUTS.
.7 SUPPLY TEST RESULTS OF THE MOTORS AND BLOWERS ALONG WITH THE OPERATION AND MAINTENANCE MANUALS.

PROCESS MECHANICAL PIPING, AND APPURTENANCES

1.0 GENERAL

1.1 WORK INCLUDED

.1 THE WORK TO BE DONE UNDER THIS SECTION CONSISTS OF FURNISHING ALL MATERIALS, LABOUR, TOOLS AND EQUIPMENT AND PERFORMING ALL OPERATIONS NECESSARY TO COMPLETE PIPING, DUCTING AND CONNECTIONS TO EQUIPMENT.

1.2 REFERENCES

.1 ASME B31.3-2020, PROCESS PIPING.
.2 ASTM A53/A53M-18, STANDARD SPECIFICATION FOR PIPE, BLACK AND HOT-DIPPED, ZINC-COATED, WELDED AND SEAMLESS.
.3 ASTM A181/A181M-12, STANDARD SPECIFICATION FOR CARBON STEEL FORGINGS FOR GENERAL PURPOSE PIPING.
.4 ASTM A240/A240M-15, STANDARD SPECIFICATION FOR CHROMIUM AND CHROMIUM-NICKEL STAINLESS STEEL PLATE, SHEET AND STRIP FOR PRESSURE VESSELS AND FOR GENERAL APPLICATIONS.
.5 ASTM A320/A320M-18, STANDARD SPECIFICATION FOR ALLOY-STEEL AND STAINLESS STEEL BOLTING FOR LOW-TEMPERATURE SERVICE.
.6 ASTM A778/A778M-16, STANDARD SPECIFICATION FOR WELDED, UNANNEALED AUSTENITIC STAINLESS STEEL TUBULAR PRODUCTS.
.7 ANSI/AWWA C606-06, GROOVED AND SHOULDERED JOINTS.
.8 ASME B16.21-2021, NONMETALLIC FLAT GASKETS FOR PIPE FLANGES.
.9 ASME B16.9-2018, FACTORY-MADE WROUGHT BUTTWELDING FITTINGS
.10 ASME B16.1-2020, CAST IRON PIPE FLANGES AND FLANGED FITTINGS.

1.3 INTENT

.1 THE INTENT OF THESE SPECIFICATIONS IS TO PROVIDE THE WORKS FULLY COMPLETE IN EVERY DETAIL FOR THE PURPOSE DESIGNATED. ANY APPARATUS, APPLIANCE, MATERIAL OR LABOUR NOT HEREIN SPECIFICALLY MENTIONED OR INCLUDED BUT REQUISITE TO THE OPERATION OF THE APPARATUS AND EQUIPMENT SPECIFIED SHALL BE FURNISHED WITHOUT ADDITIONAL EXPENSE TO THE CONTRACT.
.2 PIPES, DUCTS AND APPURTENANCES SHALL BE IN ACCORDANCE WITH DETAILS SHOWN ON THE DRAWINGS AND SHALL BE SUITABLE FOR THE PURPOSE FOR WHICH THEY ARE SPECIFIED.

1.4 SHOP DRAWINGS

.1 PROVIDE SHOP DRAWINGS FOR:
.1 PIPE, DUCT AND FITTINGS.
.2 PIPING AND DUCT LAYOUTS (PIPING 100 MM AND LARGER).
.2 PIPING ARRANGEMENTS SHALL BE DETAILED SO AS TO RELATE SPECIFICALLY TO THE TYPE OF EQUIPMENT AND FITTINGS TO BE INSTALLED. ANY CHANGES IN THE LAYOUT OF PIPING OR EQUIPMENT DUE TO THE ACCEPTANCE OF ALTERNATES MUST BE SUBMITTED WITH DIMENSIONED SCALE DRAWINGS FOR APPROVAL BY THE ENGINEER.

2.0 PRODUCTS

2.1 STAINLESS STEEL (DUCT)

.1 PIPE MATERIAL: 304 STAINLESS STEEL.

.2 ALL PIPE AND FITTINGS SHALL BE MANUFACTURED TO ASTM A778 OR ASTM A774 FROM SHEET AND PLATE OF DOMESTIC ORIGIN CONFIRMING TO ASTM A240, A-304L. SHEET FINISH SHALL BE PLATE FINISH NO. 1.

.3 PIPE AND FITTINGS FOR SERVICE UP TO 1350 kPa OPERATING PRESSURE AND MAXIMUM 95°C AND SHALL BE SUPPLIED IN THE FOLLOWING NOMINAL WALL THICKNESSES:
.1 SCHEDULE 5.

.4 FITTINGS: ELBOWS TO 600 MM SHALL BE SMOOTH FLOW SCHEDULE 5 DESIGN.

.5 STUB-ENDS TYPE A: SHALL BE 304L STAINLESS STEEL CONFIRMING TO ASTM A240 AND SHALL BE PRESSED TYPE SCHEDULE 10S, SUPPLIED WITH BEVELED ENDS TO ASME B16.9.

.6 VANSTONE RINGS: SHALL BE 304L STAINLESS STEEL CONFORMING TO ASTM A240 AND SHALL BE PRESSED TYPE WITH MINIMUM SCHEDULE 5 THICKNESS.

.7 BACKING FLANGES SHALL BE CARBON STEEL, HOT DIPPED GALVANIZED TO ASME B16.1, CLASS 150 SUITABLE FOR 1035 kPa WORKING PRESSURE.

.8 ROLL GROOVED END COUPLINGS SHALL BE RIGID STYLE VICTAULIC MODEL NO. 107 WITH EPDM HIGH TEMPERATURE GASKETS OR APPROVED EQUIVALENT.

.9 GASKETS: 3.2 MM THICK EPDM HIGH TEMPERATURE COMPOSITION, SUITABLY REINFORCED.

.10 MINIMIZE FIELD WELDING OF PIPE.

.11 BOLT ASSEMBLIES SHALL BE STAINLESS STEEL.

.12 WELDING IN FABRICATOR'S SHOP AND IN THE FIELD SHALL BE PERFORMED BY QUALIFIED WELDERS TO APPROVED PROCEDURES. WELDING ROD OR WIRE SHALL BE OF THE SAME COMPOSITION OR SUPERIOR TO THE PIPE AND FITTING MATERIAL. THE WELD DEPOSIT AT THE SEAM SHALL HAVE A SLIGHT CROWN ON BOTH SIDES OF THE WELD AND NO CRACKS OR CREVICES SHALL BE ALLOWED. EXCESSIVE WELD DEPOSITS, SLAG, WELD SPLATTER AND PROJECTIONS INTO INTERIOR OF THE PIPE SHALL BE REMOVED BY GRINDING.

2.2 CARBON STEEL (BLOWER DISCHARGE)

.1 PIPE MATERIAL: SEAMLESS BLACK STEEL.

.2 ALL PIPE AND FITTINGS SHALL BE MANUFACTURED TO ASTM A53, TYPE S, GRADE B.

.3 PIPE AND FITTINGS FOR SERVICE UP TO 1350 KPA OPERATING PRESSURE AND MAXIMUM 95°C AND SHALL BE SUPPLIED IN THE FOLLOWING NOMINAL WALL THICKNESSES:
.1 SCHEDULE 40

.4 FITTINGS: ELBOWS TO 600 MM SHALL BE SMOOTH FLOW SCHEDULE 40 DESIGN.

.5 FLANGES: .1 SHALL BE WELDNECK OR SLIP ON TYPE, SCHEDULE 40 DESIGN.
.2 VIC-FLANGES WITH HIGH TEMPERATURE EPDM GASKETS.
.3 SERIES 400 UNI-FLANGES WITH HIGH TEMPERATURE EPDM GASKETS.

202 CARBON STEEL (BLOWER DISCHARGE) (CONTINUED)

.6 GROOVED END COUPLINGS SHALL BE RIGID STYLE VICTAULIC MODEL NO. 107 WITH EPDM HIGH TEMPERATURE GASKETS OR APPROVED EQUIVALENT.

.7 GASKETS: 3.2 MM THICK EPDM HIGH TEMPERATURE COMPOSITION, SUITABLY REINFORCED.

.8 MINIMIZE FIELD WELDING OF PIPE.

.9 BOLT ASSEMBLIES SHALL BE CARBON STEEL.

.10 WELDING IN FABRICATOR'S SHOP AND IN THE FIELD SHALL BE PERFORMED BY QUALIFIED WELDERS TO APPROVED PROCEDURES. WELDING ROD OR WIRE SHALL BE OF THE SAME COMPOSITION OR SUPERIOR TO THE PIPE AND FITTING MATERIAL. THE WELD DEPOSIT AT THE SEAM SHALL HAVE A SLIGHT CROWN ON BOTH SIDES OF THE WELD AND NO CRACKS OR CREVICES SHALL BE ALLOWED. EXCESSIVE WELD DEPOSITS, SLAG, WELD SPLATTER AND PROJECTIONS INTO INTERIOR OF THE PIPE SHALL BE REMOVED BY GRINDING.

2.3 PIPE SUPPORTS

.1 ALL STAINLESS STEEL PIPE SUPPORTS TO BE OF STAINLESS STEEL CONSTRUCTION WITH STAINLESS STEEL HARDWARE.

.2 ALL CARBON STEEL PIPE SUPPORTS TO BE OF GALVANIZED STEEL CONSTRUCTION WITH ELECTROPLATED HARDWARE

2.4 VALVES

.1 BUTTERFLY VALVES

.1 WAFER TYPE BUTTERFLY VALVES, FLANGELESS, RESILIENT SEATED, CAST IRON, WAFER STYLE BODY SUITABLE FOR INSTALLATION BETWEEN ANSI B16.1 FLANGES. SEATS OF EPDM, SUITABLE FOR USE HIGH TEMPERATURE WITH AIR OR WATER. SHAFTS TO BE ONE PIECE OF 316 STAINLESS STEEL, FINISH GROUND AND POLISHED WITH EPDM SHAFT WATER. PROVIDE SHAFT BUSHINGS ABOVE AND BELOW DISK AND BELOW MOUNTING FLANGE FOR ACTUATOR. DISCS SHALL BE BRONZE. DISC TO SHAFT CONNECTIONS TO BE TYPE 316 STAINLESS STEEL. PINS, SHAFT AND DISC OF ALL VALVES MUST BE INDIVIDUALLY MACHINED AND COMPLETELY INTERCHANGEABLE.
.1 EQUIP MANUALLY OPERATED VALVES 200 MM AND SMALLER WITH MANUAL LEVER ACTUATORS.
.2 MANUALLY OPERATED VALVES 250 MM AND LARGER SHALL HAVE GEAR ACTUATORS.
.3 ACCEPTABLE PRODUCTS: KEYSTONE, BRAY, DEZURIK, JENKINS, OR APPROVED EQUIVALENT.

3.0 EXECUTION

3.1 GENERAL

.1 INSTALLATION SHALL BE IN ACCORDANCE WITH ASME B31.3.
.2 INSTALL DUCT AND PIPING IN THE LOCATIONS INDICATED, AND TO THE ELEVATIONS AND LINES AS SHOWN ON THE DRAWINGS.
.3 PROVIDE CONNECTING DUCTWORK AND PIPEWORK, FITTINGS AND VALVES WHETHER SHOWN IN THE DRAWINGS OR NOT, BUT REQUIRED FOR PROPER FUNCTIONING AND SERVICING OF THE EQUIPMENT. DO SUCH WORK IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AT NO ADDITIONAL COST TO THE CONTRACT. WHERE DUCT OR PIPE IS CONNECTED TO EQUIPMENT MAKE CONNECTION WITHOUT STRAINING DUCT, PIPE OR EQUIPMENT DURING JOINING PROCEDURE.
.4 TAKE ALL NECESSARY FIELD DIMENSIONS TO INSURE ACCURATE AND PROPER FITTING OF WORK.
.5 PIPES ENTERING CONCRETE TANKS, OR STRUCTURES SHALL BE DONE BY ONE OF THE METHODS SHOWN ON THE DRAWINGS.
.6 CO-ORDINATE LOCATION AND FURNISH EMBEDDED ITEMS TO CONTRACTOR FOR INSTALLATION IN POURED-IN-PLACE CONCRETE.
.7 CUT DUCTS OR PIPES WHERE NECESSARY TO OBTAIN THE EXACT LOCATION OF FITTINGS OR VALVES.
.8 RUN PIPING AS DIRECTLY AS PRACTICAL AND MAKE PROVISIONS FOR EXPANSION, JARRING, VIBRATIONS AND SETTLING.
.9 IN THE INSTALLATION OF DUCTS OR PIPING, DO NOT CUT GIRDERS BEAMS OR OTHER MEMBERS OF BUILDING IN SUCH A MANNER AS TO REDUCE STRENGTH OF THE GIRDER, BEAM, OR OTHER MEMBER OF THE BUILDING BELOW THAT REQUIRED FOR THE PURPOSE FOR WHICH IT WAS INTENDED.
.10 RUN DUCTS AND PIPES TO AVOID CONFLICTS BETWEEN DUCTS AND PIPES OF DIFFERENT FUNCTIONS. WHERE CONFLICTS OCCUR, BLOWER DUCTS AND PIPE SHALL HAVE PRECEDENCE OVER PLUMBING AND HEATING PRESSURE PIPES, GRAVITY PIPES WILL HAVE PRECEDENCE OVER PRESSURE PIPES AND LARGE DIAMETER PRESSURE PIPES WILL HAVE PRECEDENCE OVER SMALLER DIAMETER PIPES. NOTIFY THE ENGINEER OF CONFLICTS. THE ENGINEER WILL PROVIDE THE RESOLUTION.
.11 THE LOADING, HAULING, UNLOADING OF DUCTS, PIPES AND APPURTENANCES SHALL BE ACCOMPLISHED WITHOUT DAMAGE TO THE SAME. DROPPING OF PIPE AND APPURTENANCES ON THE GROUND WILL NOT BE PERMITTED. THE CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGE TO THE DUCT, PIPE OR APPURTENANCES UNTIL THEY ARE ACCEPTED IN THE COMPLETED WORK.
.12 NO DUCT, PIPE SHALL BE INSTALLED UNTIL MANUFACTURER'S NAME AND TEST CERTIFICATE HAVE BEEN SUBMITTED TO THE CONSULTANTS FOR APPROVAL.
.13 PROVIDE CLEARANCE AROUND SYSTEMS, EQUIPMENT AND COMPONENTS FOR OBSERVATION OF OPERATION, INSPECTION, SERVICING, MAINTENANCE AND AS RECOMMENDED BY MANUFACTURER.
.14 PROVIDE SPACE FOR DISASSEMBLY, REMOVAL OF EQUIPMENT AND COMPONENTS AS RECOMMENDED BY MANUFACTURER OR AS INDICATED (WHICHEVER IS GREATER) WITHOUT INTERRUPTING OPERATION OF OTHER SYSTEMS, EQUIPMENT, COMPONENTS.
.15 PROTECT STAINLESS STEEL PIPE AND ACCESSORIES FROM CONTAMINATION BY DUST, SHAVINGS, SCRATCHES AND SIMILAR FROM MILD STEEL WORK AND GRINDING.
.16 ALL TOOLS, BRUSHES, WIRE WHEELS, GRINDING WHEELS ETC. USED WITH STAINLESS STEEL ARE TO BE COMPATIBLE WITH STAINLESS STEEL.

3.2 JOINTING OF DUCT, PIPE AND FITTINGS

.1 WHERE DUCT OR PIPE IS TO BE CONNECTED TO EQUIPMENT, FIT PIPE SO THAT NEITHER PIPE NOR EQUIPMENT IS STRAINED DURING THE JOINING PROCEDURE.

.2 WHERE FLANGED DUCT, PIPE AND FITTINGS ARE USED, MAKE JOINTS WITH 3 MM EPDM GASKETS, BOLTS AND NUTS CONFORMING DUCT OR PIPE MATERIAL. TIGHTEN NUTS ALTERNATELY TO A UNIFORM TORQUE TO ACHIEVE EVEN DISTRIBUTION OF PRESSURE ON JOINT GASKET AND TO AVOID UNEQUAL STRESSES IN FLANGES. PROVIDE SLEEVE COUPLING, FLANGED ADAPTER, VICTAULIC COUPLING OR VIC-FLANGE COUPLE WHERE SHOWN ON THE DRAWINGS OR WHERE REQUIRED TO INSTALL PIPE OR TO PERMIT FUTURE EQUIPMENT OR PIPE REMOVAL FOR MAINTENANCE PURPOSES.

.3 GROOVED END PRODUCT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. GROOVED ENDS SHALL BE CLEAN AND FREE FROM INDENTATIONS, PROJECTIONS. GASKETS SHALL BE VERIFIED AS SUITABLE FOR THE INTENDED SERVICE PRIOR TO INSTALLATION. GASKETS SHALL BE MOLDABLE AND PRODUCED BY THE COUPLING MANUFACTURER. THE GROOVED COUPLING MANUFACTURE'S FACTORY TRAINED REPRESENTATIVE SHALL PROVIDE ON-SITE TRAINING FOR CONTRACTOR'S FIELD PERSONNEL IN THE USE OF GROOVING OR ROLLING TOOLS, APPLICATION OF GROOVE, AND INSTALLATION OF GROOVED JOINT PRODUCTS. THE MANUFACTURER'S REPRESENTATIVE SHALL PERIODICALLY VISIT THE JOBSITE AND REVIEW INSTALLATION. CONTRACTOR SHALL REMOVE AND REPLACE ANY JOINTS DEEMED IMPROPERLY INSTALLED.

.4 SCREWED PIPES SHALL BE NPT. MAKE JOINTS WITH GRAPHITE AND OIL FILLER AND ADEQUATE UNIONS PROVIDED FOR EASE OF FUTURE UNCOUPLING. REAM CUT ENDS OF PIPE TO REMOVE BURRS.

.5 INSTALL SPECIALTIES AND OTHER LIKE ITEMS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. PROVIDE SMALL PIPING, OR TUBING, WITH FITTINGS WHERE REQUIRED FOR THEIR PROPER OPERATION AND SERVICING WHETHER SHOWN ON THE DRAWINGS OR NOT.

.6 WHERE PIPE JOINTS OR FITTINGS JOINTS HAVE FAILED UNDER TEST OR DURING OPERATION, THE ENTIRE JOINT MUST BE REPLACED AND REPAIRED WITH NEW MATERIAL.

3.3 DUCT AND PIPE SUPPORT

.1 PROVIDE PERMANENT SUPPORT AS REQUIRED.

.2 ALL PIPE AND FITTINGS SHALL BE RESTRAINED SO THAT ALL THRUSTS SHALL BE SUPPORTED INDEPENDENT OF THE DUCT OR PIPING SYSTEM.

3. COORDINATE SUPPORT WORK. ENSURE PERMANENT SUPPORTS ARE COMPLETE BEFORE ANY TEMPORARY SUPPORT IS REMOVED.

.4 PROVIDE DUCT OR PIPE PADS ON PIPING AS REQUIRED FOR PERMANENT SUPPORT.

3.4 DUCT AND PIPE CLEANING TESTING AND START-UP

.1 FLUSH AND CLEAN DUCTS AND PIPES UPON COMPLETION AND PRIOR TO TESTING.

.2 PRESSURE TEST PIPING AS SPECIFIED.

.3 REMOVE AIR FROM SYSTEM. CHECK AIR VENTS AND DRAINS FOR PROPER OPERATION.

.4 BRING SYSTEM UP TO PRESSURE SLOWLY. MONITOR DUCT AND PIPE MOVEMENT. ADJUST PIPE SUPPORTS, HANGERS, EXPANSION JOINTS AS REQUIRED. RE-TIGHTEN BOLTS OR REPLACE GASKETS WHERE NECESSARY.

.5 CONTINUE TO MONITOR PIPING THROUGHOUT START-UP AND COMMISSIONING.

3.5 PIPING FOR GAUGES AND INSTRUMENTS

.1 FABRICATE AND INSTALL PIPING, ACCESSORIES AND VALVE ASSEMBLIES FOR PRESSURE SENSING GAUGES AND TRANSDUCERS AS INDICATED ON THE DRAWINGS.

.2 COORDINATE LOCATIONS FOR GAUGES AND INSTRUMENTS ON PIPING LAYOUTS.

3.6 PAINTING

.1 PAINT VALVES.

.2 STAINLESS STEEL PIPE AND ACCESSORIES TO BE CLEANED.

.3 PRIME AND PAINT CARBON STEEL PIPING TO MATCH EXISTING.

.4 COORDINATE PAINTING WORK TO AVOID CONFLICTS.

3.7 CLEANUP

.1 UPON COMPLETION OF TESTING, REMOVE ALL TEST EQUIPMENT AND CAP HOLES TO SATISFACTION OF THE OWNER.

.2 CLEAN AND REFURBISH ALL EQUIPMENT AND FIXTURES AND LEAVE IN OPERATING CONDITION IN PREPARATION FOR FINAL ACCEPTANCE.

3.8 WELDING OF DUCTS AND PIPES

.1 ALL WELDING SHALL BE IN ACCORDANCE WITH ASME B31.3 PROCESS PIPING, LATEST EDITION.

.2 WELDING OF PIPE SHALL BE PERFORMED BY QUALIFIED WELDERS IN ACCORDANCE WITH APPROVED PROCEDURES IN MANUFACTURER'S PLANT. FIELD WELDS SHOULD BE KEPT TO A MINIMUM.

.3 WELDING ROD OR WIRE SHALL BE OF THE SAME COMPOSITION OR SUPERIOR TO THE PIPE AND FITTING MATERIAL.

.4 THE WELD DEPOSIT AT THE SEAM SHALL HAVE A SLIGHT CROWN ON BOTH SIDES OF THE WELD AND NO CRACKS OR CREVICES SHALL BE ALLOWED.

.5 REMOVE ANY EXCESSIVE WELD DEPOSITS, SPLATTER, OR SLAG ON THE INSIDE AND OUTSIDE OF DUCT OR PIPE. AFTER GRINDING, POLISH WITH STAINLESS STEEL BRUSH TO REMOVE IRON DEPOSITS.

.6 ALL FIELD WELDS OF STAINLESS STEEL DUCT OR PIPE SHALL BE TREATED WITH PICKLING PASTE, THE SCRUBBED A STAINLESS STEEL BRUSH OR POWER WHEEL.

.7 IDENTIFY EACH WELD WITH WELDER'S INSPECTION SYMBOL PRIOR TO INSPECTION.

.8 DO NOT CONCEAL WELDS UNTIL THEY HAVE BEEN INSPECTED AND APPROVED

.9 PROTECT STAINLESS STEEL DUCT, PIPE AND ACCESSORIES ROM CONTAMINATION BY DUST, SHAVINGS, SCRATCHES AND SIMILAR FROM MILD STEEL WORK AND GRINDING.

.10 ALL TOOLS, BRUSHES, WIRE WHEELS, GRINDING WHEELS, ETC. USED WITH STAINLESS STEEL ARE TO BE COMPATIBLE WITH STAINLESS STEEL.

3.9 NON-DESTRUCTIVE WELD EXAMINATION

.1 VISUALLY EXAMINE ALL WELDS FOR COMPLIANCE WITH APPLICABLE CODES.

.2 RANDOM EXAMINATION OF WELDS USING RADIOGRAPHIC EXAMINATION PROCEDURES ARE SPECIFIED IN ASME B31.3 WILL BE PERFORMED BY A QUALIFIED INDEPENDENT TESTING AGENCY AT THE DISCRETION OF THE CONSULTANT.

.3 ALL SUCH COSTS OF NON-DESTRUCTIVE RADIOGRAPHIC WELD EXAMINATIONS TO BE BORNE BY OWNER.

3.10 WARRANTY

.1 ALL WORK OF REPAIR OR REPLACEMENT CARRIED OUT DURING THE WARRANTY PERIOD SHALL BE MAINTAINED FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF THE CONSULTANT'S ACCEPTANCE OF THE WORK OF REPAIR OR REPLACEMENT NOTWITHSTANDING THAT THE WARRANTY PERIOD EXPIRES BEFORE THE EXPIRATION OF SAID YEAR. THIS CLAUSE SHALL NOT APPLY TO NORMAL OPERATION MAINTENANCE, WHICH SHALL BE CARRIED OUT BY THE OWNER.

CLIENT:
CITY OF SAINT JOHN

ELEC CONSULTANT:
MCW Maricor
77 VAUGHAN HARVEY BLVD, SUITE 200
MONCTON, NB E1C 0K2
BUS: (506) 857-8880 FAX: (506) 859-8393
WWW.MCW.COM ENG. JOB NO. 12-22-020

PROCESS CONSULTANT:
CBCL

STAMP:
LICENCED PROFESSIONAL ENGINEER
Province of New Brunswick
L4093 2022
Michael Abbott
Signature
Oct. 7, 2022
Date
INGENIEUR TITULAIRE DE PERMIS
Province du Nouveau-Brunswick

NO:	REVISIONS	DATE YYYY/MM/DD	INIT.
0	ISSUED FOR TENDER	2022/10/7	DA
A	ISSUED FOR 99% REVIEW	2022/07/20	DA

PROJECT TITLE:
LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

DRAWING TITLE:
PROCESS SPECIFICATION PAGE 2 OF 2

SCALE:	DATE:
AS NOTED	APRIL, 2022
DRAWN BY: D. ABREY	DRAWING NO: P04
CHECKED BY: M. ABBOTT	

Sheet Size: B1

City of Saint John

CONTRACT SPECIFICATIONS

DIVISION 4

FORM OF TENDER

OCTOBER 2022

City of Saint John

TABLE OF CONTENTS

DIVISION 4 – FORM OF TENDER

4.1 TENDER IDENTIFICATION

Tender No: **2022-085302T**

Title of Work: **LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL**

4.2 TENDERER'S RESPONSIBILITIES AND AGREEMENT

TO THE CITY OF SAINT JOHN, NEW BRUNSWICK:

The undersigned hereby agrees that failure to complete all required parts of the Form of Tender shall be subject to the reserved rights of the City and shall be grounds for rejection of the Tender in accordance with Section 2.11.

The undersigned Tenderer has carefully examined the site of the Work described herein, has become familiar with local conditions and the character and extent of the Work, has carefully examined every part of the proposed Contract, and thoroughly understands its stipulations, requirements and provisions and has carefully examined all of the following documents which together comprise the Tender Documents:

1. Project Description (Division 1)
2. Instructions to Tenderers and Tendering Procedures (Division 2)
3. The Particular Specifications (Division 3)
4. The Form of Tender (Division 4)
5. The Form of Agreement (Division 5)
6. The General Specifications (Divisions 6 through 31)
7. The Plans and Drawings
8. Addenda Issued

together, the "Tender Documents".

The undersigned Tenderer has determined the quality and quantity of materials required, has investigated the location and determined the source of supply of materials required, has investigated labour conditions, and has arranged for the continuous execution of the Work herein described.

The undersigned Tenderer hereby agrees to be bound by the award of the contract, and if awarded the Contract, to sign the Form of Agreement (Division 5) within five (5) working days following the City's Notice of Selection.

In the event the City accepts its Tender, the undersigned Tenderer hereby agrees to Substantially Complete the Work no later than to be determined.

The undersigned Tenderer agrees that they have received all Addenda and the Tender Price includes the provisions set out in the Addenda.

4.2 TENDERER'S RESPONSIBILITIES AND AGREEMENT (Cont'd)

The undersigned Tenderer further agrees to provide all necessary permits, approvals, labour, material, plant, equipment, tools, incidentals, products, water, light, heat, power, transportation, facilities, services and other means of the specified requirements which are necessary to complete the work in accordance with the contract and agrees to accept, therefore, in payment in full, the unit prices stated herein in the *Schedule of Quantities and Unit Prices*, for the actual quantities performed in accordance with the drawings and specifications, for the total sum of

_____
_____
_____

in Canadian Funds, (the "Tender Price").

By submitting a Tender, the Tenderer absolutely waives any right, cause of action or claim for any compensation of any kind whatsoever as a result of participating in this Request for Tender Call or by reason of the City's failure to accept the Tender submitted by the Tenderer, and the Tenderer shall be deemed to have agreed to waive such right, cause of action or claim.

Place of Signing: Signed, sealed and delivered at _____

Date of Signing: This _____ day of _____, in the year _____

Name and Title: By_____

Legal Name of Tenderer: _____ *PLACE*

Signature of Tenderer or Authorized Agent: _____ *SEAL*

Signature of Witness: _____ *HERE*

Address of Tenderer: _____

_____

4.3 BONDING AND INSURANCE COMMITMENTS

Failure of the Tenderer to complete Sections 4.3.01, 4.3.02 and 4.3.03 may be grounds for rejection of the Tender.

4.3.01 Tender (Bid) Bond or Certified Cheque

A certified cheque or Tender (Bid) Bond accompanies this Tender, as indicated below:

(a) Certified Cheque

Provided is a certified cheque payable to The City of Saint John in the amount of

_____

***Signature of Tenderer or Authorized Agent**:* _____

(b) Tender (Bid) Bond

Provided is a Tender (Bid) Bond payable to The City of Saint John in the amount of

_____

The Tender (Bid) Bond has been negotiated for, procured from and the premium paid to a New Brunswick agent of an insurance company licensed to do business in New Brunswick.

***Signature of Tenderer or Authorized Agent**:* _____

4.3.02 Performance Guarantees

One of the following acceptable forms of Performance Guarantees will accompany the Contract, as indicated below:

Performance Bond and the Labour and Material Payment Bond

The Performance Bond and the Labour and Material Payment Bond, each at fifty percent (50%) of the Tender Price covering the faithful performance of the full Contract, will be issued by an insurer licensed under the *Insurance Act* to transact guarantee insurance or surety insurance.

The Performance Bond and the Labour and Material Payment Bond shall be in the form prescribed by the regulations under the *Construction Remedies Act*. Where permitted pursuant to the *Construction Remedies Act* and where specifically allowed and called for in the Tender Documents as being permitted, the City may allow alternate forms of security.

A surety consent letter or Agreement to Bond must accompany the Tender submission.

***Signature of Tenderer or Authorized Agent**:* _____

4.3.03 Insurance

The undersigned Tenderer has reviewed the insurance requirements in the Contract. The following provision for contract insurances will be utilized, as indicated below:

The insurance required in the contract will be negotiated for, procured from and the premium paid to an insurance company licensed to do business in the Province of New Brunswick.

Signature of Tenderer or Authorized Agent: _____

4.4 STATEMENTS

A Tender which does not include completed statements at Sections 4.4.01 to 4.4.07 hereunder and the duly completed Schedule of Quantities and Unit Prices at Appendix 4A may be Disqualified.

4.4.01 Reference Regarding Tenderer's Financial Status

Name of Reference: _____

Address of Reference: _____

_____

4.4.02 Particulars of Tenderer's Recent Contracts

The Tenderer shall provide hereunder particulars of at least three (3), and if possible, five (5) contracts which the Tenderer has successfully carried to completion within the last three (3) years, or is now carrying to completion.

Tenderers shall be actually engaged in performing the type and standard of work specified, and the projects referenced below shall be work of a similar character to the Work now being tendered and shall be of comparable or greater size.

Tenderers who have not performed work for The City of Saint John within the last three (3) years shall submit additional information with the Form of Tender that would demonstrate the Tenderer's ability to perform the type and standard of work specified and the Tenderer's financial, technical and project management reliability.

4.4.02 Particulars of Tenderer's Recent Contracts (Cont'd)

Contract 1: Brief description of contract: _____

_____

_____

Owner, contact name and telephone number: _____

_____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

Contract 2: Brief description of contract: _____

_____

_____

Owner, contact name and telephone number: _____

_____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

Contract 3: Brief description of contract: _____

_____

_____

Owner, contact name and telephone number: _____

_____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

4.4.02 Particulars of Tenderer's Recent Contracts (Cont'd)

Contract 4: Brief description of contract: _____

_____

_____

Owner, contact name and telephone number: _____

_____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

Contract 5: Brief description of contract: _____

_____

_____

Owner, contact name and telephone number: _____

_____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

Contract 6: Brief description of contract: _____

_____

_____

Owner, contact name and telephone number: _____

_____

Contractor's supervisor: _____

Year completed: _____ Contract Value: _____

4.4.03 Particulars of Current Construction Work by Tenderer

If none of the projects described in 4.4.02 were in progress in Canada during the twelve (12) months immediately preceding this Tender, the Tenderer shall provide below particulars of a contract which the Tenderer satisfactorily carried out in Canada during that period.

Brief description of contract: _____

_____

_____

Owner, contact name
and telephone number: _____

_____

Date of commencement: _____

Date of (anticipated) completion: _____

Contract value: _____

Contractor's supervisor: _____

4.4.04 Tenderer's Senior Supervisory Staff

The Tenderer shall identify their senior supervisory staff in the spaces below.

Tenderers who have not performed work for the City within the last three (3) years shall submit with their Form of Tender a completed resume for each staff member listed hereunder outlining their experience, education, designations/certificates and continued training/education.)

Name	Position	Qualifications	# Years Experience

4.4.05 Tenderer's Plant

The Tenderer shall list below the construction plant (type of machinery, equipment, trucks, etc.) the Tenderer proposes to use, other plant under the Tenderers control, and the plant the Tenderer proposes to hire, to complete the work within the time allowed.

Type	Make	Model # & Year	Gas/ Diesel	Net Engine Horsepower	Bucket Size Excavator GVW

4.4.06 Tenderer's Other Resources

The Tenderer shall list below the batch plant, gravel pits or quarries, and the like that the Tenderer proposes to use to complete the work within the time allowed.

4.4.07 Sub-Contractors and Suppliers

Tenderers shall state the name and address of each proposed sub-contractor or supplier.

The listing of more than one sub-contractor or supplier for any one sub-trade or failure to submit a complete list of sub-contractors and suppliers may be grounds for rejection of the Tender. After the City has provided the selected Tenderer with written notification of the City's acceptance of its Tender, the selected Tenderer shall not substitute other sub-contractors or suppliers in place of those named below without the written approval of the Engineer.

Sub-Trade or Supplier	Name of Sub-Contractor/Supplier	Address

4.5 SCHEDULE OF QUANTITIES AND UNIT PRICES

The tenderer shall complete and attach as Appendix 4A the required *Schedule of Quantities and Unit Prices* for the Work tendered, in the format specified by the Engineer.

4.6 CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying Tender to The City of Saint John for:

Tender No.: ***2022-085302T***

Title of Work: ***LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL***

do hereby make the following statements that I certify to be true and complete in every respect:

I certify, on behalf of _____ that:

(Corporate Name of Tenderer)

4.6 CERTIFICATE OF INDEPENDENT TENDER DETERMINATION (Cont'd)

1. I have read and I understand the contents of this Certificate;

2. I understand that the accompanying Tender will be disqualified if this Certificate is found not to be true and complete in every respect;

3. I am authorized by the Tenderer to sign this Certificate, and to submit the accompanying Tender, on behalf of the Tenderer;

4. Each person whose signature appears on the accompanying Tender has been authorized by the Tenderer to determine the terms of, and to sign, the Tender, on behalf of the Tenderer;

5. For the purposes of this Certificate and the accompanying Tender, I understand that the word "competitor" shall include any individual or organization, other than the Tenderer, whether or not affiliated with the Tenderer, who:

(a) may submit a Tender in response to this Request for Tender;

(b) could potentially submit a Tender in response to this Request for Tender, based on their qualifications, abilities or experience;

6. The Tenderer discloses that (check one of the following only, as applicable):

☐ the Tenderer has arrived at the accompanying Tender independently from, and without consultation, communication, agreement or arrangement with, any competitor; or

☐ the Tenderer has entered into consultations, communications, agreements or arrangements with one or more competitors regarding this Request for Tender, and the Tenderer discloses, in the attached document(s), complete details thereof, including the names of the competitors and the nature of, and reasons for, such consultations, communications, agreements or arrangements.

7. In particular, without limiting the generality of paragraphs (6)(a) or (6)(b) above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

(a) prices;

(b) methods, factors or formulas used to calculate prices;

(c) the intention or decision to submit, or not to submit, a Tender; or

(d) the submission of a Tender which does not meet the specifications of the Request for Tender;

except as specifically disclosed pursuant to paragraph (6)(b) above;

4.6 CERTIFICATE OF INDEPENDENT TENDER DETERMINATION (Cont'd)

8. In addition, there has been no consultation, communication, agreement or arrangement with any competitor regarding the quality, quantity, specifications or delivery particulars of the products or services to which this Request for Tender relates, except as specifically authorized by The City of Saint John or as specifically disclosed pursuant to paragraph (6)(b) above;

9. The terms of the accompanying Tender have not been, and will not be, knowingly disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official Tender Opening, or of the awarding of the Contract, whichever comes first, unless otherwise required by law or as specifically disclosed pursuant to paragraph (6)(b) above.

Name of Tenderer or Authorized Agent: _____

Signature of Tenderer or Authorized Agent: _____

Position Title: _____

Date: _____

Address of Tenderer: _____

_____

ATTACHMENT: TENDERER'S CHECKLIST

(The onus is entirely on the Tenderer to understand all the requirements of the tendering process and the Tender Documents. This checklist is provided for information only and is not required to be submitted with the Form of Tender.)

BEFORE SUBMITTING YOUR TENDER, CHECK THE FOLLOWING POINTS:

- ☐ Has your Tender been signed and witnessed?
- ☐ Have you sealed the *Form of Tender* with your corporate seal?
- ☐ Have you enclosed your Tender (Bid) Bond or certified cheque?
- ☐ Have you enclosed the surety consent letter?
- ☐ Have you completed all sections of the *Form of Tender*?
- ☐ Have you completed all schedules and prices in the *Form of Tender*?
- ☐ Have you written each unit price or lump sum price out in words, including the words "dollars" and "cents"?
- ☐ Have you included signed copies of all addenda signature pages?
- ☐ Have you listed your Subcontractors and suppliers?
- ☐ Have you listed your experience in similar work?
- ☐ Have you listed your senior staff?
- ☐ Have you listed the Tenderer's plant?
- ☐ Have you attached required appendices and required supplemental information?
- ☐ Are the documents complete?
- ☐ Is everything legible?

PLEASE MAKE SURE THAT YOU:

(a) Place the Tender in an envelope;
(b) Seal the envelope;
(c) Put the Tender number, title of Work and closing date and time on the sealed envelope;
(d) Put the full legal name and return address of the Tenderer on the envelope; and
(e) Deposit the envelope in the Tender Box located at 175 Rothesay Avenue, 1st Floor, Saint John, N.B.

DIVISION 4.5

SCHEDULE OF QUANTITIES AND UNIT PRICES

UNIT PRICE TO BE EITHER TYPEWRITTEN OR PRINTED IN INK IN WORDS AND PRINTED NUMERICALLY

CONTRACT NUMBER 2022-085302T

TITLE: LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

Item	DESCRIPTION	UNIT	Qty.	Unit Price	Amount
1	DO Instrumentation	LS	1	$	$
2	Blower No. 1 Upgrade	LS	1	$	$
3	Blower No. 5 Upgrade	LS	1	$	$
4	Existing Blower Header Modifications	LS	1	$	$

Estimated Construction Costs ***(Excluding Taxes)***	$	$

City of Saint John

CONTRACT SPECIFICATIONS

DIVISION 5

FORM OF AGREEMENT

OCTOBER 2022

City of Saint John

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DIVISION 5 – FORM OF AGREEMENT

5.1 AGREEMENT BETWEEN OWNER AND CONTRACTOR

THIS AGREEMENT made in triplicate between **THE CITY OF SAINT JOHN** herein (and in the Specifications) called the "Owner" or the “City”

AND

_____

herein (and in the Specifications) called the "Contractor".

WITNESSETH: That the Owner and the Contractor agree as follows:

a) The Contractor shall provide all the materials and perform all the work shown on the drawings and described in the Contract Specifications titled:

Contract No: 2022-085302T

Title: LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

b) The Contractor shall do and fulfill everything indicated by this Agreement; and

c) The Contractor shall Substantially Complete the Work no later than to be determined.

5.2 CONTRACT DOCUMENTS

5.2.01 General Specifications

General Specifications, City of Saint John, New Brunswick,
with all applicable divisions, as updated and as listed in the Table of Contents of the Contract Specifications.

5.2.02 Contract Specifications

Contract specifications for

Contract No: 2022-085302T

Title: LANCASTER LAGOON BLOWER UPGRADE AND DO CONTROL

City of Saint John, New Brunswick,

5.2.02 Drawings

Sheet No.	Title
E-1	Electrical Site Plan and Specifications
E-2	Electrical Blower Building Floor Plans and Single Line Diagrams
P01	Dissolved Oxygen Upgrade Site Plan & Details
P02	New Blower Plans, Section and Details
P03	Process Specification Page 1 of 2
P04	Process Specification Page 2 of 2

5.3 ADDENDA

The Contractor agrees that he has received addenda ___ to ___ inclusive, and that the tender price includes the provisions set out in the addenda.

5.4 CONTRACT PRICE

The Owner shall pay to the Contractor, in lawful money of Canada for the performance of the Contract, the amounts determined for each of the items of work completed at the unit prices as listed in the Schedule of Quantities and Unit Prices, submitted with the tender, which is to be attached with this Agreement, for the total tender price of:

_____

_____

(Excluding Taxes)

If the Engineer orders in writing the performance of any work not covered by the drawings or included in the specifications that cannot be classified as coming under any of the contract units and for which a unit price can be agreed upon, then such additional work shall be paid for as described under the General Administration of Contract, Division 6.

5.5 PAYMENT

The Owner shall pay on account of thereof upon the Engineer's Certificate, as invoiced by the Contractor and approved by the Engineer, in the manner described in the Specifications.

5.6 AGREEMENT DOCUMENTS

The General Administration of Contract, Division 6 and the aforesaid Specifications and Drawings are all to be read into and form part of this Agreement and the whole shall constitute the Contract between the parties and it shall inure to the benefit of and be binding upon them and their successors, executors, administrators, and subject to the General Administration of Contract, their assigns.

5.7 EXECUTION OF AGREEMENT

In Witness Whereof the parties hereto have executed this Agreement.

	) SIGNED, SEALED AND DELIVERED
	)
	) this _____ day of _____, _____
	)
	) by _____
	) (Contractor)
	)
_____	) _____
(Witness)	) (Signature)
	)
_____	) _____
(Name and Title)	) (Name and Title)
	)
	) _____
	) (Signature)
	)
	) _____
	) (Name and Title)
	)
	)
	) *PLACE SEAL HERE*

	)
	)
	) SIGNED, SEALED AND DELIVERED
	)
	) this _____ day of _____, _____
	)
	) by THE CITY OF SAINT JOHN.
	)
	)
	) _____
	) MAYOR
	)
	) _____
	) COMMON CLERK
	)
	)
	)
	) *PLACE SEAL HERE*

5.8 AFFIDAVIT OF CORPORATE EXECUTION

CANADA
PROVINCE OF NEW BRUNSWICK
CITY OF SAINT JOHN
I, _____, of the _____
in the County of _____, and Province of New Brunswick
MAKE OATH AND SAY:

(1) THAT I am the _____ of _____, and _____ is the _____ of the said Company, as such I am/we are duly authorized officer(s) of the said Company to execute the foregoing instrument.

(2) THAT the signature _____ subscribed to the within instrument is my signature and in my own proper handwriting and that the signature _____ so subscribed is his signature made thereto by him in my presence.

(3) THAT the Seal affixed to the said instrument purporting to be the Corporate Seal of the said _____ is the Corporate Seal of the said Company and was affixed to the said instrument by me and by order of the Board of Directors of the Company.

SWORN TO BEFORE ME at the_____)
)
of _____)
)
in the Province of _____)
)
this _____ day of _____ A.D., _____.)
)
_____) _____
COMMISSIONER OF OATHS) CONTRACTOR
)

Note: The blank spaces are to be filled in with the name or names of the signing officer(s).

5.9 CHECKLIST FOR INSURANCE REQUIREMENTS

The insurance coverage required by the City is set out in General Administration of Contract, Division 6, of the General Specifications. An Insurance Certificate is to be deposited with the City.

The certificate of insurance should contain at least the following information:

- ❑ Be addressed to the City of Saint John.
- ❑ Be signed by an authorized representative on behalf of the insurance company.
- ❑ Contain a Wrap-up (Project Specific) Liability policy with inclusive limits of at least five million dollars ($5,000,000.00).
- ❑ Show that the City of Saint John, the Contractor and Sub-Contractors, the Engineer and the Architect, are added as Additional Insured with respect to the operations of the Contractor.
- ❑ Confirm coverage for bodily injury and property damage and set forth the amount.
- ❑ Confirm that there is coverage for Contractual Liability with respect to this Contract.
- ❑ Confirm that the policy contains a cross liability clause.
- ❑ Confirm that there is Contingent Employer's Liability Coverage.
- ❑ Confirm that there is coverage for Broad Form Property Damage.
- ❑ Confirm that there is Completed Operations coverage with respect to this contract and that such coverage shall continue to be in force for the duration of the guarantee period (maintenance period) which is a period of twelve (12) months from the date of issuance of the Certificate of Final Completion.
- ❑ Confirm that there is coverage for Non-Owned Automobiles or licensed vehicles.
- ❑ Confirm that there is coverage for Owned Automobiles or licensed vehicles.
- ❑ Confirm that the indicated policies will not be cancelled, substantially amended, or allowed to lapse without the City first being given a thirty (30) day written notice.