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City of Brandon

Notice of Alteration

Aeration Upgrade at the Municipal Pre-Treatment Facility

Prepared by:
AECOM Canada Ltd.
99 Commerce Drive
Winnipeg MB R3P 0Y7

Prepared for:
Manitoba Sustainable Development
Environmental Approvals Branch
1007 Century Street
Winnipeg, MB R3H 0W4

Date: August 24, 2018

Project #: 60581456

Distribution List

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AECOM Canada Ltd.
99 Commerce Drive
Winnipeg MB R3P 0Y7
Canada

T: 204.477.5381
F: 204.284.2040
aecom.com

August 24, 2018

Project #
60581456

Director of Approvals
Manitoba Sustainable Development
Environmental Approvals Branch
1007 Century Street
Winnipeg, Manitoba R3H 0W4

Dear Director of Approvals:

Subject: Notice of Alteration
Aeration Upgrade at the Municipal Pre-Treatment Facility

Please find enclosed two hard copies and one electronic copy of the Notice of Alteration (NOA) and supporting information to obtain approval for the aeration upgrade to the City of Brandon Municipal Wastewater Pre-Treatment Facility.

The proposed upgrade at the Municipal Wastewater Pre-Treatment Facility will be an upgrade to the existing aeration process that will not alter environmental effects, thus no fee is associated with our submission.

Should you have any questions regarding the information enclosed, please do not hesitate to contact me directly at 204-928-7475.

Sincerely,
AECOM Canada Ltd.

Kristiina Cusitar, BA, CET, EP(SAR)
Environmental Assessor

KC:rd

Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("AECOM") for the benefit of the Client ("Client") in accordance with the agreement between AECOM and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

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- represents AECOM's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to AECOM which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
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- was prepared for the specific purposes described in the Report and the Agreement; and
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This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

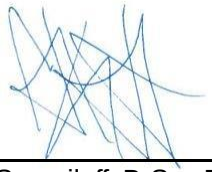
AECOM: 2015-04-13

Quality Information

Report Prepared By:

Kristiina Cusitar, BA, CET, EP(SAR)
Environmental Assessor

Report Reviewed By:



Clifton Samoiloff, B.Sc., EP(CEA)
Senior Scientist
Environment, Western Canada

Executive Summary

AECOM Canada Ltd. (AECOM) completed a Pre-Design Report for the Aeration Upgrade at the City of Brandon Municipal Pre-Treatment Facility in July 2018 and is in the process of completing the detailed design. It has been determined that the existing aeration system including piping, pipe restraints, pumps and blowers have reached the end of their service life and are in need of replacement. The City of Brandon (City) Municipal Pre-Treatment Facility is located at 4040 Victoria Avenue East. This facility operates under Environment Act License No. 2991, issued February 2012.

This Notice of Alteration (NOA) has been prepared by AECOM on behalf of the City in accordance with Manitoba Sustainable Development's Information Bulleting (2017), "*Alterations to Developments with Environment Act Licences*". This report outlines the proposed equipment upgrades within the facility which will not alter environmental effects. It has been prepared and submitted for consideration for the City's NOA application under *The Environment Act*, CCSM c E125. A copy of the NOA Form is attached in **Appendix A**.

The environmental effects of the proposed upgrades at the Municipal Pre-Treatment Facility have been assessed to be negligible as the proposed alterations to equipment within the facility are not anticipated to alter environmental effects due to the construction and/or treatment process.

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1. Introduction

1.1 Project Overview

AECOM completed a Pre-Design Report for the Aeration Upgrade at the City of Brandon Municipal Pre-Treatment Facility in July 2018 and is in the process of completing the Detailed Design. It was determined that the existing aeration system including piping, pipe restraints, pumps and blowers have reached the end of their service life and are in need of replacement.

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1.2 Proponent Contact Information

Name of Project	Aeration Upgrade at the Municipal Pre-Treatment Facility
Name of Proponent	Alexia Stangherlin Director of Utilities Development Services Branch City of Brandon
Address of Proponent	410-9th Street Brandon, MB R7A 6A2
Principal Contact Person(s) for this EAP	Kristiina Cusitar Environmental Assessor, Impact Assessment & Permitting Environment, Canada West AECOM D +1-204-928-7475 kristiina.cusitar@aecom.com

1.3 Project Schedule

The pre-design phase has been completed and a pre-design report was submitted to the City on July 31, 2018. The detailed design phase, including tender documents and specifications and drawings will be completed by August 28, 2018. Several days have been granted for review by the City before being tendered. A four week tendering period has been allowed, followed by a one week tender review period. Contract award is anticipated for October 15, 2018, as the project will require Council approval. Because of the long lead time for the blowers, it is not critical that the contract be awarded by October 15, 2018 as

the contractor can only carry out some of the work prior to the delivery of the new blowers. However, awarding the contract as early as possible will give the contractor more time to arrange other long lead-time items such as the diffusers. Construction is anticipated to commence on November 26, 2018 since the contractor is unlikely to mobilize to site two months in advance of blower delivery.

A tentative schedule summary table is provided in **Table 1-1**.

Table 1-1: Tentative Project Schedule

Pre-Design	
• Submit purchase order for two (2) Aerzen GM 130L blowers (by City)	July 27, 2018
• Submit pre-design report	July 31, 2018
Detailed Design	
• Begin detailed design	August 1, 2018
• Submit detailed design report, tender documents, specifications and drawings	August 28, 2018
• Tender Period (by City)	August 29 – September 25, 2018
• Tender Review	September 26 – October 2, 2018
• Contract Award	October 15, 2018
Construction	
• Construction commencement	November 26, 2018
• Final commissioning and inspections	February 15, 2019
• Project completion	February 27, 2019

2. Project Description

2.1 Background

In 1975, the City constructed a 17,000 m^3 aeration basin complete with secondary clarifier at 4040 Victoria Avenue East. In 1994, the aeration basin was modified to create a two basin sequencing batch reactor (SBR) system in order to comply with newly promulgated effluent ammonia and combined sewer overflow criteria set by the Clean Environment Commission. The SBR reactors were equipped with a jet aeration system to provide mixing and aeration. Three 75 kW submersible Flygt recirculation pumps were installed in each SBR to mix the SBR contents with the incoming air in the jet aeration system.

In 2012, during the Phase III Upgrade, the Municipal wastewater treatment plant was converted to a pre-treatment facility. The SBR decanters were removed, and submersible mixers installed. The aeration system was retained to keep the sewage fresh and prevent the formation of odours. A separate pipe was installed in the SBRs to allow flow to discharge by gravity to the effluent pump well, which transfers the effluent to the City's Industrial Water Reclamation Facility (WRF) for further treatment.

The Municipal Pre-Treatment Facility layout is provided in **Figure 2 1** below.

Figure 2-1: Municipal Pre-Treatment Facility

2.2 Scope

The pre-design evaluated several options for replacing the blowers and aeration system as well as identified any necessary upgrades to structural, electrical and process control systems. Recommendations and construction cost estimates were provided for the recommended alternatives. The pre-design also assisted in forming an implementation strategy for the construction works.

2.3 Proposed Capital Works

The following capital works are proposed for this project:

- Decommissioning and removal of the existing aeration system including piping, pipe restraints and blowers;
- Installation of a new aeration system including piping and pipe restraints;
- Installation of new blowers and connection to the existing air headers, including new blower intakes;
- Installation of new variable frequency drives (VFDs) for blower speed control;
- New cabling from the existing motor control center (MCC) to the new blowers and installation of electrical blower hardware in existing MCC buckets; and
- Routing and connecting the inputs and outputs (I/Os) for the new blowers and local controls at the MCC and logic programming for blower speed control.

These upgrades will allow the City to continue to use the SBRs as equalization tanks and will efficiently aerate and mix the screened and de-gritted wastewater until it can be transferred to the WRF.

3. Existing Facility and Equipment

3.1 Process Flow

The existing Municipal Pre-Treatment Facility screens and removes grit from the wastewater prior to sending the wastewater to equalisation tanks, where peaks in flow can be managed to allow a continuous flow to the WRF. A process flow diagram is included in **Figure 3 1** below.

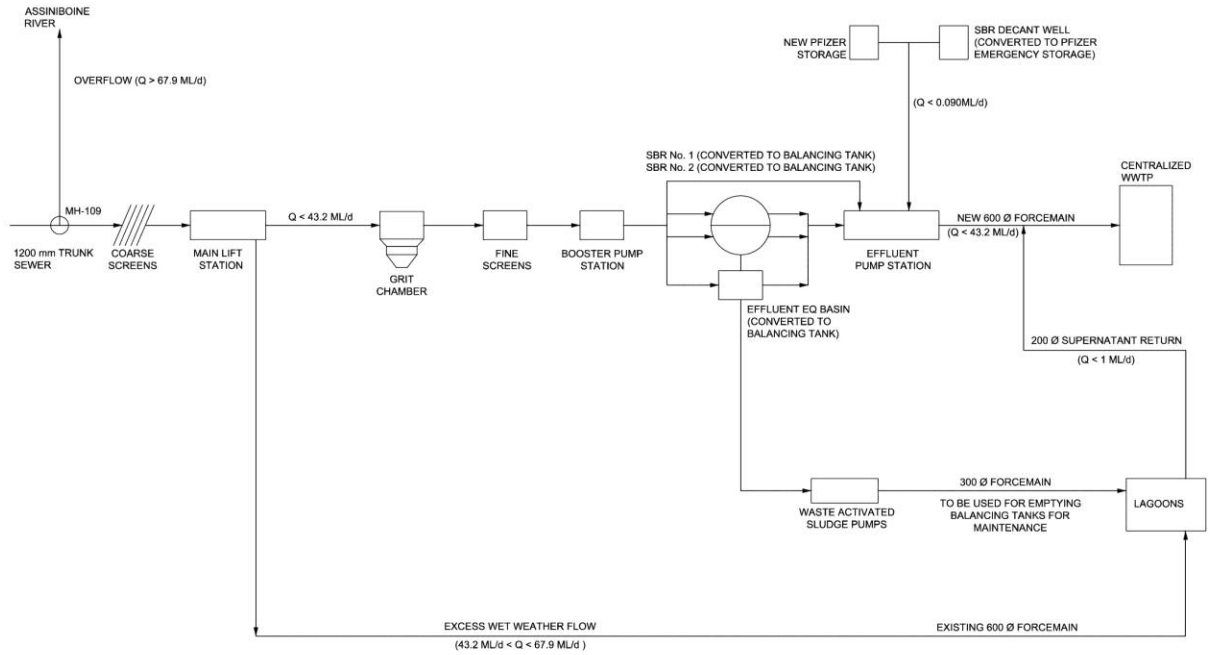


Figure 3-1: Process Flow Diagram for the Municipal Pre-Treatment Facility

3.2 SBR Configuration

The existing SBRs are two semi-circular concrete basins with an approximate volume of 8,810 m^3 each. The basins are separated by a common wall and a decanter well is located in the center of the basins. Water levels fluctuate between 3.2 m and 5.1 m. Decant pumps transfer the wastewater from the SBRs to the equalization tank where it is then pumped to the WRF. Water levels fluctuate based on the influent hourly diurnal flow pattern. The SBRs can be operated independently of each other.

3.3 Blowers

Three 187 kW (250 hp) Lamson centrifugal blowers supply air to the aeration system. Each blower has a design flow capacity of 123.7 m^3/min (4,370 scfm). Previous aeration testing indicated that the standard oxygen transfer rate (SOTR) with two blowers operating at the design point was 909 kgO_2/hr. Air headers and a series of valves allow any of the blowers to provide air to either of the SBRs. Each blower sits on a blower pad that is approximately 3,100 mm by 1,000 mm by 100 mm thick. The City has indicated that the blowers have reached the end of their service life.

Electrical power comes from the MCCs that are located in the electrical room nearby. Power cables from the MCCs run below the gallery floor through a crawl space and come up through the floor before they connect to the motors.

3.4 Jet Aeration System

The SBRs are equipped with a Jet-Tech jet aeration system and 75 kW submersible recirculation pumps to provide aeration and mixing while submersible mixers improve mixing and keep solids in suspension. One blower operating at maximum capacity, supplied an SOTR of 647 kgO_2/hr. A stainless steel air header connects the blowers to the diffuser array. Aeration is provided to keep sewage fresh until it reaches the WRF and prevent the formation of odours. The jet aeration system is in poor condition and will not be reused. The proprietary 'black box' associated with the original Jet-Tech programming is no longer used, but is still in place and will also be decommissioned.

3.5 Blower and Pipe Gallery

The existing gallery houses the three existing Lamson blowers and air piping from the blowers to the SBRs as well as various other piping, including old waste activated sludge lines, primary effluent piping and various sample stations. Primary effluent pipes bring the screened and de-gritted wastewater to the SBRs. Several sample stations are also located in the gallery, however these are no longer used. Two electrical rooms are located adjacent to the gallery.

The existing air header is 500 mm insulated pipe with associated interconnections to allow any blower to aerate either SBR. Piping from the blowers to the main headers is 300 mm insulated pipe. Butterfly valves were installed to direct the air through the appropriate pipes. The air headers in the gallery are thought to be in good condition and will be reused.

4. Design Criteria

4.1 SBR Configuration

The existing SBRs offer significant equalization volume and appear to be in acceptable condition. Some concrete has spalled near the high water mark on both SBRs.

Wastewater received by the SBRs comes from the pre-treatment facility where it has already been screened and de-gritted. The average characteristics are summarized in **Table 4-1.**

Table 4-1: Summary of the SBR Influent Characteristics

Parameter	Unit	Value
Flow	ML/d	38
Chemical Oxygen Demand	mg/L	440
Total Suspended Solids	mg/L	157
Ammonia	mg/L	26
pH	-	7.41
Alkalinity	mg/L	282

This influent quality was used to determine the oxygen requirements of the wastewater, which was used to verify the oxygen demand.

Mixing requirements were calculated based on the volume of the SBRs. Using literature values for mixing, a minimum of $10m^3/min/1000m^3$ of air is required for mixing (not a rolling pattern). This equates to a minimum total air requirement of 110 m^3/min to 175 m^3/min to mix both SBR tanks, based on minimum and maximum water levels. No changes to the shape or volume of the SBRs are proposed, therefore, the new aeration system was designed to fit the existing tanks. Since the air required for mixing exceeded that for biological oxygen demand (BOD) removal, the air flow rates required for mixing governed the design.

The City has indicated that a core through the south end of the dividing wall between the two SBRs may be beneficial to improve circulation and mixing of the wastewater. The core would be equipped with a slide gate to allow independent operation of the SBRs.

4.2 Blower Design

There are two main types of blowers that are commonly used for aeration applications; centrifugal and positive displacement. Centrifugal blowers such as those currently installed at the SBRs are generally not well suited for applications involving changing liquid levels. Positive displacement blowers like those installed at the WRF are designed to operate at varying discharge pressures, and are a better solution for aerating the SBRs.

The operating depth of the SBR (3.2 m to 5.1 m) has a large impact on the sizing of the blowers needed to achieve a dissolved oxygen level of 2 mg/L. As the water level decreases, the efficiency of the oxygen transfer into the wastewater decreases, thereby requiring more air. For example, the blower size needed at 3.2 m of SBR depth is approximately 40% larger than needed at a 5.1 m water depth. However, since the SBRs are no longer used for secondary treatment, mixing requirements will determine air flow rates rather than oxygen demand. Therefore, blower speeds will be related to the water depth in the tank.

The City has indicated a preference for similar blower models and motor sizes as those installed at the WRF. There are currently 60 hp, 150 hp and 200 hp blowers in use at the WRF. Based on the aeration and mixing requirements, the mixing requirements governs the design. An approximate peak air flow of 175 m^3/min will be required to achieve adequate mixing. Since secondary treatment is performed at the WRF, oxygenation for the purpose of BOD removal is not critical. However, enough air needs to be provided to prevent the formation of sulphides and other odour causing compounds. Therefore, the primary purpose of aeration is to keep solids in suspension and the wastewater fresh until it can be transferred to the WRF for further treatment.

4.2.1 Blower Model and Motor Size

AECOM evaluated the possibility of using Aerzen GM 150S blowers with 200 hp motors and Aerzen GM 130L blowers with 150 hp motors. The GM 150S blowers are the same as those installed in the Chemical Building at the WRF, while the GM 130L blowers are the same as those installed in the Membrane Building at the WRF. For both models and motor sizes, two duty blowers are needed to provide the required turn down to efficiently provide aeration for both summer and winter conditions. A third blower could be provided as a stand-by unit, however, because the aeration process is non-critical, a stand-by unit is not required. Instead, spare parts including a blower stage and motor are recommended. Since

the mixers will be reused, solid suspension can be achieved with the mixers in the event that one of the blowers must be removed from service.

The City indicated that GM 130L blowers with 150 hp motors are the preferred size as they match the existing blowers in the Membrane Building. Matching blower models and motor sizes will provide operation and maintenance flexibility as spare parts can be used at either facility, and since the aeration for the membrane bioreactors (MBR) is critical, added redundancy for the MBRs is beneficial. The City is also interested in standardizing blower models and motor sizes to simplify maintenance activities. Therefore, two duty Aerzen GM 130L blowers are recommended along with a spare blower stage and motor. The operating air flow rate range of the GM 130L blowers is between 28 m^3/min and 108 m^3/min.

Noise levels from a single blower are approximately 105 dB(A) without an acoustic enclosure, however, this can be reduced to approximately 77 dB(A) with an acoustic enclosure. Although the blower gallery is not frequently occupied by plant operators, the noise levels from two blowers will be a significant safety concern and therefore sound enclosures are recommended.

4.2.2 Blower Layout

The new Aerzen blowers will be much larger than the existing Lamson blowers; each blower will be 3,100 mm by 2,100 mm by 2,345 mm tall, including the acoustical enclosure. The blower inlet and outlet piping is located on the same side of the enclosure, which results in some additional piping required to connect the blower outlet to the existing air headers. New roof mounted blower intakes will be required due to the size and shape of the Aerzen blowers.

To retain the flexibility of either blower being able to aerate either SBR, two 300 mm butterfly valves will be installed in the existing piping. A plan drawing showing the layout of the blowers, piping, and valves is included in **Appendix B.** Provided the butterfly valves are in good condition, BF-6, BF-7, BF-8 and BF-9 will be reused. Two of the valves will be used on the new blower intake line to isolate the blower from the intakes, while the other two will be installed in the existing piping. If new valves are required, manual butterfly valves are recommended as the valve positions will only be fully open or fully closed.

The two blowers have been arranged such that the lifting points of the blower equipment are not below a roof beam or existing piping. This will provide the maximum headroom to facilitate lifting and removing the top cover, filter, blower and motor. A portable, adjustable height, fixed span gantry crane is recommended for maintenance as the top rail will need to be lowered in order for the crane to pass below hanging pipes, then raised once positioned above the blower. There will be approximately 1,200 mm of headroom between the top of the blower and the bottom of the roof slab. The span of the crane should be approximately twice as wide as the blower to allow removal of the top cover; the clear span should be about 4,200 mm. The crane will be rated for at least the heaviest single piece of equipment in the blower package.

4.3 Diffuser Design

The diffuser design is based on a robust, low maintenance system that is capable of providing sufficient mixing to minimize solids deposition. Several diffuser options are available, such as coarse bubble, jet aeration, or fine bubble systems, however, stainless steel coarse bubble diffusers offer reliability, durability, and are simple to maintain. The 304 stainless steel parts, including anchors, resist corrosion. The main disadvantage of a coarse bubble diffuser is that it tends to have a low oxygen transfer efficiency relative to the other diffuser types; however, because the diffusers will primarily be used for mixing, oxygen transfer efficiency is not a primary concern.

In the past, the City has occasionally used a skid loader to clean out the bottom of the SBRs as solids did deposit over time. The diffuser design also considered the ability to easily clean the SBRs and has allowed sufficient space for a skid loader to maneuver in the basins.

4.4 Electrical and Instrumentation

Some electrical and instrumentation upgrades will be required to support the new blowers. However, these upgrades will be minor.

The blower electrical hardware upgrades will be completed in the existing electrical room and motor control centre buckets. Some new cabling will be run from the electrical room through the crawl space to the new blower locations. Local controls for the blowers will be added at the MCC. A single line diagram is included in **Appendix B**.

Two variable frequency drives (VFDs) will be installed to modulate the speed of the blowers to match the air demand, which will minimize electricity demands. These will replace the existing constant speed blowers and motorized intake air throttling valves. The local controls for the new blowers will be located on the MCC in the adjacent electrical room.

New inputs and outputs (I/Os) will be run for the new blowers and instrumentation that is included with the blowers. These I/Os will be installed into the existing programmable logic controller. The existing supervisory control and data acquisition (SCADA) system will be reprogrammed after the blowers are installed. As the operating regime for the blowers will remain the same after the upgrade, the instrumentation will not change significantly from what is currently installed. Included with the blower package are a pressure gauge, pressure switch vacuum gauge, vacuum switch, dirty filter indicator, and thermometer. These instruments will monitor the conditions of the blowers to allow safe operation. A process and instrumentation diagram is included in **Appendix B**.

5. Implementation Strategy

5.1 Maintaining Facility Operations

The Municipal Pre-Treatment Facility will need to remain in operation during construction, which means that one SBR will need to remain in service at all times, except for approved shutdowns. Air will need to be provided to the SBR that is in service, which means that some of the existing blowers will need to remain in service until one of the new blowers is installed and operational.

A possible construction sequence is presented below:

- Drain SBR 2, turn off Blowers 1 and 2, close BF-10 and use Blower 3 to aerate SBR 1.
- Close and cap BF-1 and BF-2 and remove air piping from Blower 1 to tee before BF-1, from Blower 2 to BF-2 and piping from Blower 2 to SBR 2 supply. Cap fitting at supply. Remove Blowers 1 and 2, including intakes. Plug intake penetrations.
- Install new Blower 1 and associated piping and valves as shown in **Appendix B**.

- While removal of Blower 1 and Blower 2 and installation of new Blower 1 and associated piping are in progress, remove aeration headers and diffusers from SBR 2. Install new diffusers and air headers and connect header to SBR 2 Supply inside gallery.
- Before SBR 2 is returned to service, divert pre-treated wastewater around the SBRs and send to Lagoon 3. Drain SBR 1. Perform coring through south end of SBR dividing wall and install slide gate. Fill SBR 1 with potable water up to top of slide gate to begin commissioning slide gate. Fill remaining volume in SBR 1 with wastewater to finish commissioning slide gate. It is anticipated that both SBRs will be out of service for one week. Lagoon 3 has adequate storage capacity to accept the bypassed flow.
- Discontinue bypassing pre-treated wastewater to Lagoon 3 and return SBR 1 to service. Wastewater collected in Lagoon 3 will remain in the Lagoon until it meets Licence requirements or transferred to the WRF for further treatment.
- Commission new Blower 1 and new diffusers. Partially fill SBR 2 with potable water to verify placement and bubble pattern of diffusers. Fill remaining SBR volume with pre-treated wastewater to complete performance testing.
- Return SBR 2 to service and begin aerating with new Blower 1 leaving BF-10 closed. Drain SBR 1 and turn off Blower 3.
- Remove piping from Blower 3 to the tee nearest BF-10. Cap south side of tee. Remove Blower 3 including intake. Plug intake penetration.
- Install new Blower 3 and associated piping and valves as shown in **Appendix B**.
- While removal of Blower 3 and installation of new Blower 2 and associated piping are in progress, remove aeration headers and diffusers from SBR 1. Install new diffusers and air headers and connect header to SBR 1 supply inside gallery. Finish coring hole on south end of dividing wall between SBRs 1 and 2.
- Commission new Blower 2 and new diffusers.
- Return SBR 2 to service and aerate each SBR with one blower. The new piping will be arranged such that either blower can aerate either SBR.

All new electrical and instrumentation will be installed when the blowers are being installed. Removal of existing blowers will include removing the existing blower pads, if required. New pads will be installed as needed to keep the blowers above floor level.

5.2 SBR Bypass

As shown in **Figure 3-1**, the pre-treated wastewater can be diverted at the main lift station and sent to the lagoons. During the time that both SBRs will be out of service, the wastewater will be screened by the coarse screens and then all of the flow diverted at the main lift station and sent to Lagoon 3 via the existing 600 mm forcemain. Lagoon 3 will be empty during this time and will be able to store all of the bypassed wastewater. If Lagoon 3 were to fill up, then it would overflow to Lagoon 5, which is also currently empty, therefore even more storage will be available.

The average flow for the winter months is approximately 16 ML/d. If all of the flow is bypassed to Lagoon 3 for one week, the total volume of storage required is approximately 115 million litres. The volume of Lagoon 3 is approximately 215 million litres, therefore Lagoon 3 is sufficient to store the bypassed wastewater.

A figure showing the location of the Municipal Pre-Treatment Facility and Lagoons is provided below **Figure 5-1**.

Figure 5-1: Municipal Pre-Treatment Facility

6. Environmental Effects

These alterations to equipment within the Municipal Pre-Treatment Facility are not anticipated to alter environmental effects due to the construction and/or treatment process. Therefore, no environmental effects due to these upgrades are expected.

7. Conclusion

As the upgrades to process equipment are within the Municipal Pre-Treatment Facility, there will be no environmental effects from these upgrades.

Appendix A
Notice of Alteration Form

Notice of Alteration Form

Manitoba
Sustainable Development

Client File No. :	Environment Act Licence No. : 2991

Legal name of the Licencee: City of Brandon

Name of the development: Aeration Upgrade at the Municipal Pre-Treatment Facility

Category and Type of development per Classes of Development Regulation:

Waste Treatment and Storage — Wastewater treatment plants

Licencee Contact Person: Alexia Stangherlin
Mailing address of the Licencee: 410-9th Street
City: Brandon Province: Manitoba Postal Code: R7A 6A2
Phone Number: (204) 729-2231 Fax: Email: a.stangherlin@brandon.ca

Name of proponent contact person for purposes of the environmental assessment (e.g. consultant):
Kristiina Cusitar

Phone: (204) 477-5381 Fax: (204) 284-2040	Mailing address: 99 Commerce Drive, Winnipeg, MB

Email address:

Short Description of Alteration *(max 90 characters)*:
Equipment upgrades within the Municipal Pre-Treatment Facility.

Alteration fee attached: Yes: ☐ No: ☑

If No, please explain: Alterations to equipment that do not change the environmental effects.

Date: 2018-08-24	Signature:  Printed name: Alexia Stangherlin

A complete Notice of Alteration **(NoA)** consists of the following components:

- ☑ **Cover letter**
- ☑ **Notice of Alteration Form**
- ☑ **2 hard copies and 1 electronic copy of the NoA detailed report** (see "Information Bulletin - Alteration to Developments with Environment Act Licences")
- ☐ **$500 Application fee, if applicable** (Cheque, payable to the Minister of Finance)

Submit the complete NoA to:

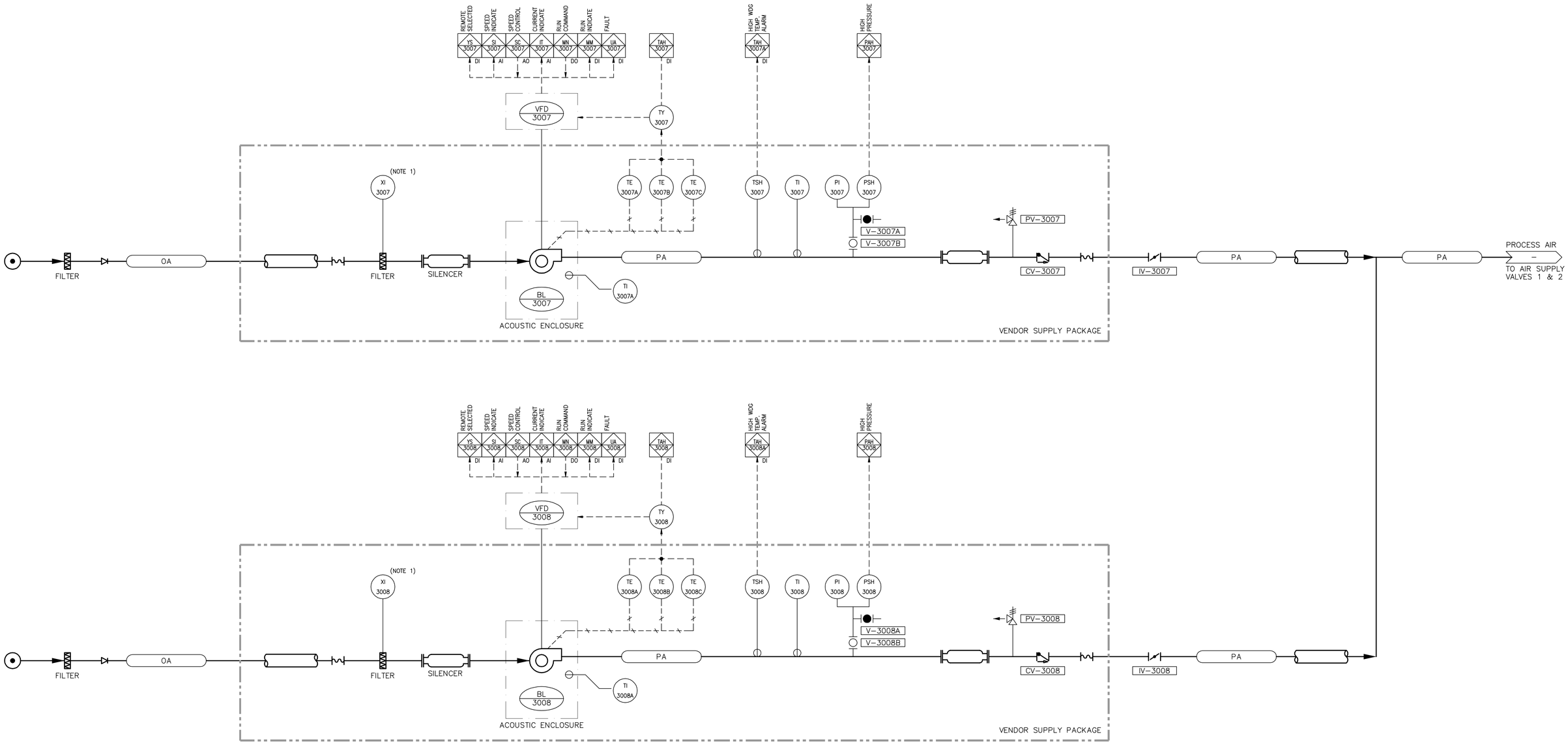
Director
Environmental Approvals Branch
Manitoba Sustainable Development
1007 Century Street
Winnipeg, Manitoba R3H 0W4

For more information:

Phone: (204) 945-8321
Fax: (204) 945-5229
http://www.gov.mb.ca/sd/eal

Note: Per Section 14(3) of the Environment Act, Major Notices of Alteration must be filed through submission of an Environment Act Proposal Form (see "Information Bulletin – Environment Act Proposal Report Guidelines")

Appendix B
Figures – Process Blowers



NOTES:
1. DIRTY FILTER INDICATION

AECOM FILE NAME:

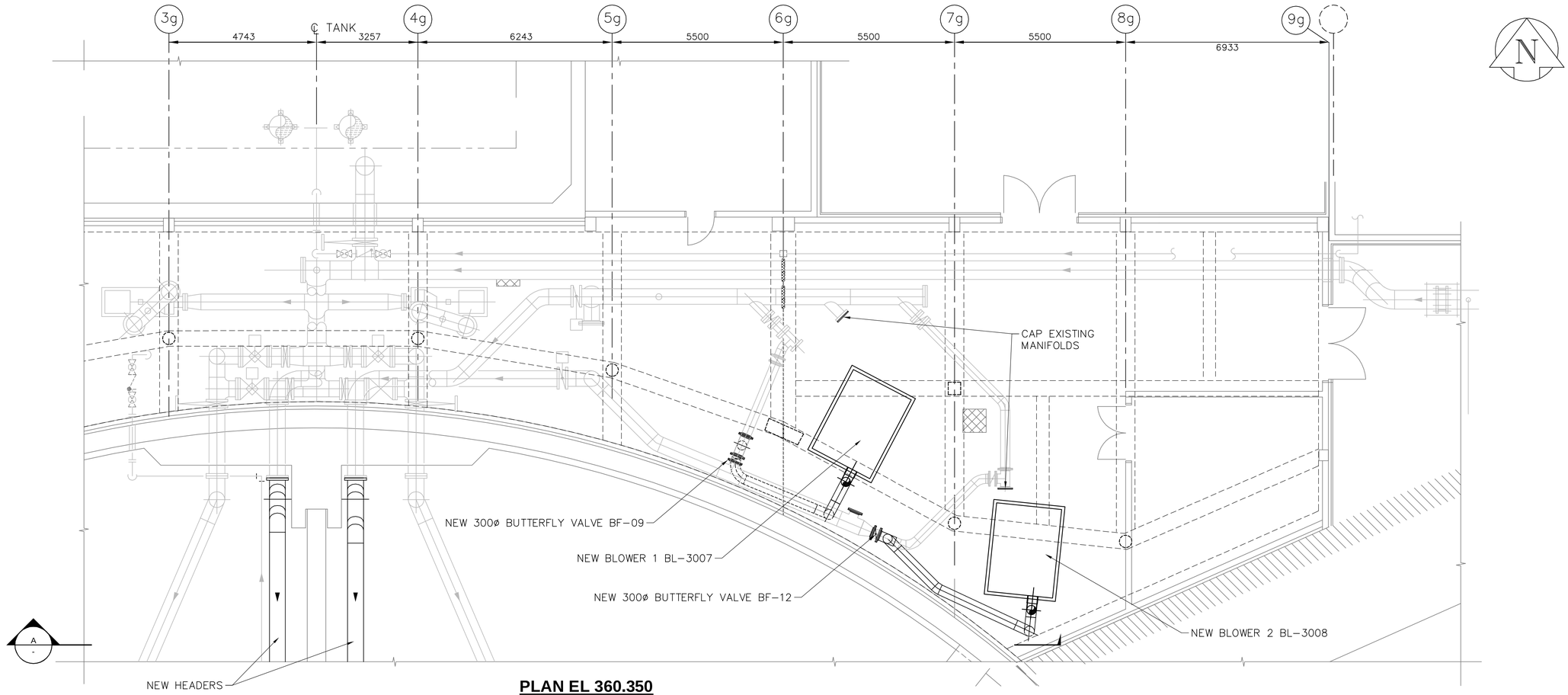
PROFESSIONAL SEALS

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
A	18/07/31	PRE-DESIGN REPORT	SRG	IG	SS			

AECOM

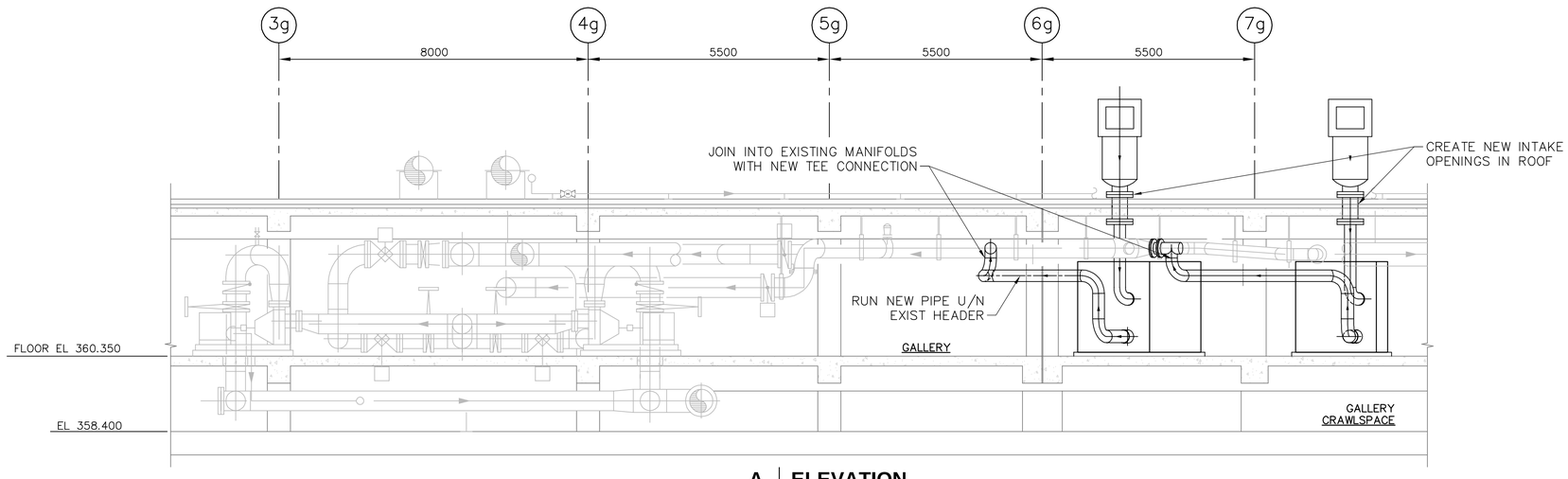
City of Brandon
Municipal Pre-Treatment Facility
Aeration Upgrade - Pre-Design
Process Blowers
Process & Instrumentation Diagram

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60581456	FIGURE P1	A



PLAN EL 360.350

Scale 1:100



A - ELEVATION

Scale 1:100

AECOM FILE NAME:

PROFESSIONAL SEALS

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
A	18/07/31	PRE-DESIGN REPORT	M.S	IG	SS			

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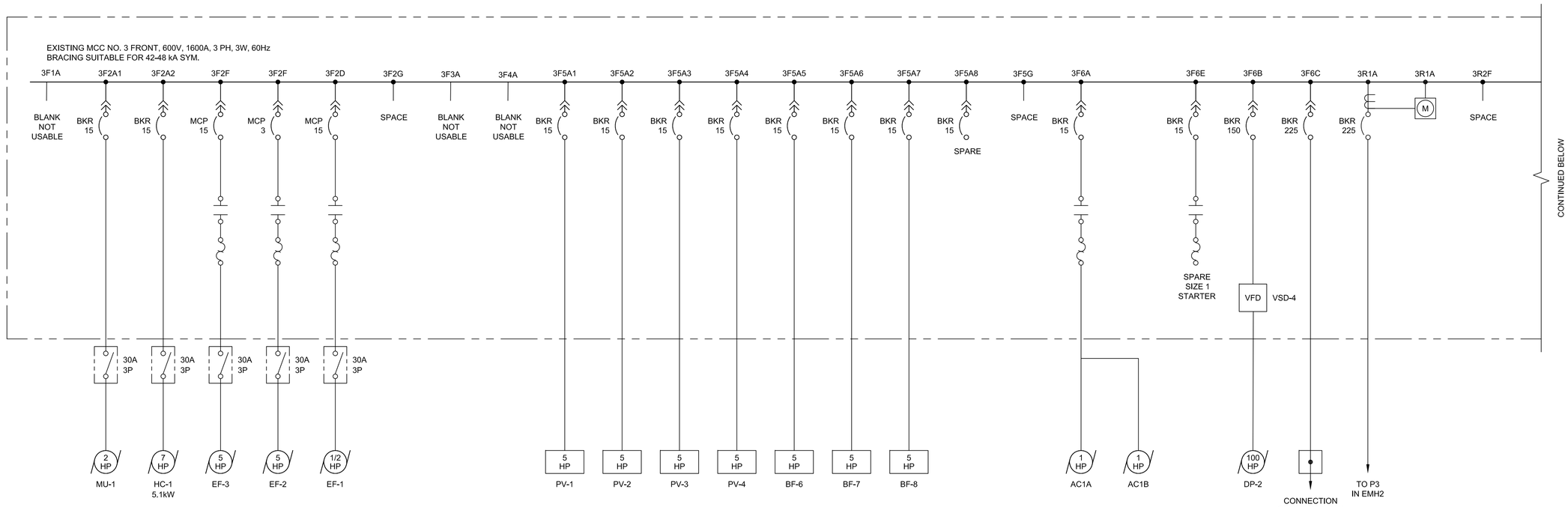
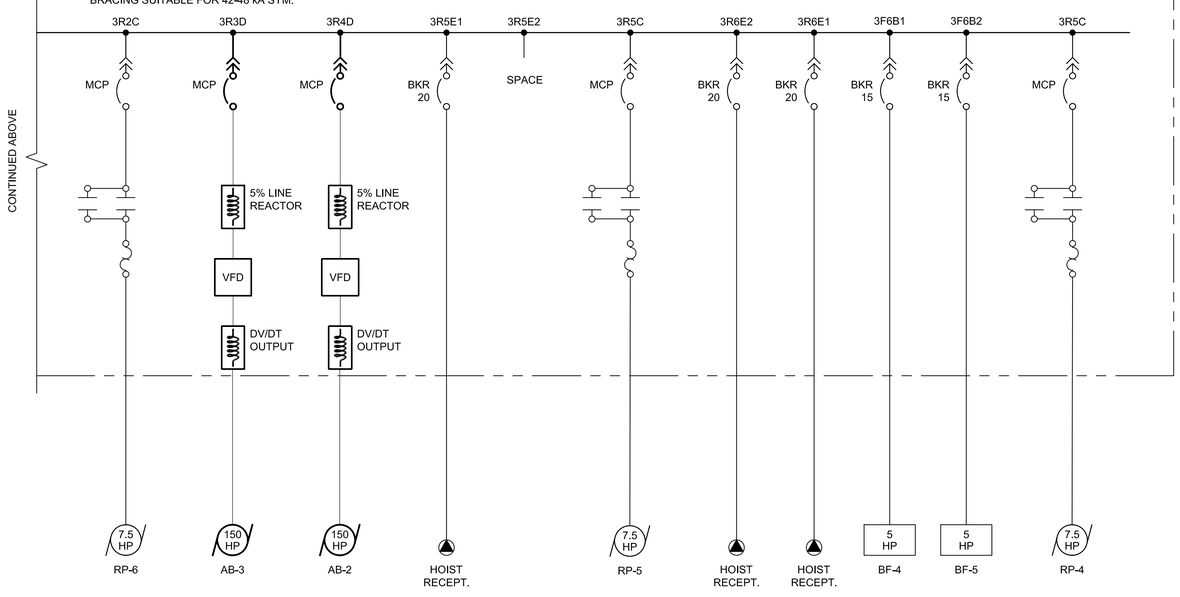
City of Brandon
Municipal Pre-Treatment Facility
Aeration Upgrade - Pre-Design
PROCESS BLOWERS
LAYOUT

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60581456	FIGURE P2	A





NOTE:

1. SINGLE LINE UPDATED FROM CONTRACT 3 DRAWINGS.

PROFESSIONAL SEALS

I/R	YY/MM/DD	ISSUE/REVISION DESCRIPTION	DRN	CHK	DES	ENG	IDR	APP
A	18/07/21	PRE-DESIGN REPORT	MJP	JG	JG			

AECOM

City of Brandon
Municipal Pre-Treatment Facility
Aeration Upgrade - Pre-Design
ELECTRICAL
SINGLE LINE DRAWING EXISTING MCC-3

PROJECT NUMBER	DRAWING NUMBER	ISSUE/REVISION
60581456	FIGURE E1	A

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