

NEWPCC BOILER REPLACEMENT 2025-2026 - COMMISSIONING PLAN

Revision:

Rev 0

KGS Group Project: 23-0107-010

Client Project: S-1284

Date: April 2, 2025 Prepared by:

Atustes

Andrew Fustey, P.Eng. Mechanical Engineer

Reviewed by:

Jason Smith, P. Eng. Senior Mechanical Engineer

Sault Approved by:

Prasan Silva, P. Eng. Senior Mechanical Engineer

TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 COMMISSIONING TEAM	2
2.1 Participants	2
2.2 Roles and Responsibilities	2
3.0 SCHEDULE	5
4.0 COMMISSIONING REQUIREMENTS	6
4.1 General	6
4.2 Specifications	6
4.3 Mechanical Commissioning Works	9
4.3.1 Pre-COMMISSIONING	9
4.3.2 COMMISSIONING Tasks – BLR-B0005, BLR-B0006, BLR-B0007	10
4.3.3 COMMISSIONING Tasks – P-B0110, P-0120, P-B0130, P-B0140, P-B0150	10
4.3.4 Performance Verification	10
4.4 Electrical Commissioning Works	11
4.4.1 Pre-COMMISSIONING	11
4.4.2 Commissioning Tasks – MCC-B7001, MCC-B7002	11
4.4.3 COMMISSIONING Tasks	11
4.4.4 Performance Verification	11
4.5 City of Winnipeg Forms 100 to 104 Intent	12
5.0 TRAINING	14
5.1 Training Session Objectives	14
6.0 O&M MANUAL	16



List of Tables

Table 1: Roles and ResponsibilitiesTable 2: Mechanical Equipment to be CommissionedTable 3: Electrical Equipment and Systems to be Commissioned

List of Appendices

Appendix A: Commissioning Schedule Appendix B: Pre-Commissioning and Commissioning Forms Appendix C: Commissioning Deficiency Log



STATEMENT OF LIMITATIONS AND CONDITIONS

Limitations

This report has been prepared for The City of Winnipeg ("The City") in accordance with the agreement between KGS Group and The City (the "Agreement"). This report represents KGS Group's professional judgment and exercising due care consistent with the preparation of similar reports. The information, data, recommendations and conclusions in this report are subject to the constraints and limitations in the Agreement and the qualifications in this report. This report must be read as a whole, and sections or parts should not be read out of context.

This report is based on information made available to KGS Group by The City. Unless stated otherwise, KGS Group has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith. KGS Group shall not be responsible for conditions/issues it was not authorized or able to investigate or which were beyond the scope of its work. The information and conclusions provided in this report apply only as they existed at the time of KGS Group's work.

Third Party Use of Report

Any use a third party makes of this report or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this report.



1.0 INTRODUCTION

Boiler 5 was installed in 1999 to serve as a backup boiler to the four existing hot water boilers in the main boiler room at the North End Sewage Treatment Plant (NEWPCC). The boiler is a hot water heating type boiler with original design maximum rated output of 3433 kW. Boiler 5 was taken out of service in April 2022 due to boiler mechanical failure. An interim backup boiler system was installed in 2024 for redundant emergency capacity to replace boiler 5, while a permanent boiler system was designed.

A new permanent boiler system will be installed to replace the existing Boiler 5 and interim backup system. The permanent boiler system will consist of two new 1962 kW boilers, three new circulation pumps, flowmeters and a new flash steam separator tank. The boiler control system will include controls by the boiler vendor, which will be integrated into the City Process Control System (PCS) system. The PCS system will have new HMI screens dedicated to boilers 5 and 6, which interface with the boiler vendor controls.

The following document provides a plan for the start-up, testing, operation and acceptance criteria for the commissioning of the new equipment and systems installed for the project. It details the commissioning processes, roles and responsibilities, commissioning specifications and objectives, procedures, verification requirements, and documentation for the Project.



2.0 COMMISSIONING TEAM

2.1 Participants

Commissioning will require the participation of the following organizations to verify the performance of the equipment and systems:

- General Contractor, and Subcontractors.
- Original Equipment Manufacturer (OEM).
- Contract Administrator KGS Group.
- Owner/Client City of Winnipeg (The City).

2.2 Roles and Responsibilities

The Contract Administrator is to provide comprehensive planning and leadership for the commissioning of the works. In cooperation with the Contractor and Owner, the Contract Administrator will be responsible for ensuring that all commissioning activities are carried out to allow for the delivery of a fully operational facility that is compliant and complete. The Contract Administrator will provide sufficient personnel to develop, manage and implement the commissioning works as illustrated by Table 1 below.

The Contractor shall be responsible for the commissioning work under the direction of the Contract Administrator. The Contractor shall be capable of carrying out the commissioning duties outlined below or employ a commissioning agent subcontractor to assist with the duties. The Contractor will be responsible for carrying out testing on-site and demonstrating that the system adheres to project specifications and operates satisfactorily. The Contract Administrator will witness and monitor the commissioning activities, and upon satisfactory completion of the commissioning, will review the documentation provided by the Contractor for acceptance. A Commissioning handover package will be compiled and provided to the City by the Contract Administrator, which includes all commissioning documentation, including:

- Commissioning Completion Report
- Project commissioning plans and procedures
- Evidence of commissioning verification
- Deficiency reports and corrective action taken
- Training material and records
- Other commissioning documents



TABLE 1 ROLES AND RESPONSIBILITIES

			Responsibility	
Item	Task Description	Organization	Department (If Applicable)	Individual (If Applicable)
1	Safely perform all pre-commissioning, commissioning and performance verification activities.	Contractor		
2	Obtain all required approvals from Authority Having Jurisdiction (Inspection and Technical Services Manitoba, Manitoba Hydro Winnipeg Area) for the installed boilers, piping, and new MCCs.	Contractor		
3	Safely operate the equipment as required to perform commissioning activities	Contractor		
4	Document equipment and control system settings.	Contractor		
5	Provide operations and maintenance manuals.	Contractor		
6	Provide as-built drawings.	Contractor		
7	Provide training to maintenance staff and operators in accordance with City standards.	Contractor		
8	Schedule and coordinate commissioning works with respect to the construction schedule.	Contract Administrator & Contractor		
9	Prepare agenda and record minutes of commissioning meetings.	Contract Administrator		
10	Verify and document the performance of all assets impacted by the construction works, prior to starting construction.	The City		
11	Attend and witness pre-commissioning, commissioning and performance verification activities	Contract Administrator & The City		
12	Track deficiencies, record corrective measures	Contract Administrator		
13	Supply commissioning record sheets, test forms, and other documentation.	Contract Administrator		



			Responsibility	
Item	Task Description	Organization	Department (If Applicable)	Individual (If Applicable)
14	Review and approve commissioning handover package.	Contract Administrator		
15	Start-up and shut down of existing systems required for the commissioning work.	The City		
16	Monitor alarms during performance verification.	Contract Administrator and The City		
17	Apply and remove safety lockouts as required.	The City		
18	Carry out process testing during Performance Verification.	Contractor		
19	Perform all required Plant PCS and HMI programming and network integration for control of new equipment.	City		
20	Commissioning Completion Report in accordance with RFP 325-2023 - D12.7	Contract Administrator		



3.0 SCHEDULE

A preliminary construction schedule that includes a high-level commissioning section is provided in Appendix A. The schedule identifies the general timeline for key items such as anticipated pre-commissioning activities (including vendor start-up of equipment), commissioning of boilers, pumps and other associated mechanical and electrical equipment, and performance verification of the overall system.

A detailed commissioning schedule to be prepared by the Contractor in consultation with the Contract Administrator during construction. The detailed commissioning schedule shall be submitted for review and approval of the Contract Administrator minimum of 4 weeks prior to the start of the commissioning activities.



4.0 COMMISSIONING REQUIREMENTS

4.1 General

Commissioning of the boilers and associated systems will follow the requirements of the technical specifications listed in the reference section and make use of the commissioning forms and procedures described therein and equipment vendor recommended start-up or commissioning documents. In addition to these documents, the Contractor is responsible for reviewing the full scope of drawings and specifications and meeting all of the commissioning requirements listed therein.

The following is a general list of the systems to be commissioned. Each system named below includes all electrical and mechanical components that operate together to achieve the desired purpose.

- Hydronic Systems
- Remote Monitoring/Control
- Natural and Digester Gas System
- Nitrogen Systems
- Power Distribution
- PCS Automation Systems

Detailed commissioning requirements for each mechanical and electrical system and device are provided in Sections 4.3 and 4.4.

Appendix B has been provided with pre-commissioning and commissioning documentation to be completed by the Contractor. Documentation will be updated as the control narrative continues to be developed, should any updates be necessary. The Contactor shall be responsible for carrying out the pre-commissioning tests, commissioning tests, and performance verification described therein.

4.2 Specifications

The general commissioning specifications, in addition to technical specification Section 01 91 13, applicable to the work are as follows:

- The Contractor shall submit completed testing and field commissioning record sheets on which the results of the various checks and tests shall be recorded, dated, and approved by the OEM and/or installation Subcontractor and the Contract Administrator. Pre-commissioning and commissioning record sheets are contained in Appendix B. Contractor and OEM shall provide evidence of Factory Acceptance Tests for boilers, pumps and other major equipment, prior to beginning on-site commissioning.
- 2. The scope of equipment to be tested is shown in Table 2 and 3. Additional associated components and systems may also require commissioning.
- 3. The Contractor shall advise the Contract Administrator and the City in writing when the work may be inspected before proceeding with the next commissioning task. The equipment and systems shall not be started before the approval of the Contract Administrator has been obtained.



- 4. The Contractor is responsible for providing the necessary tools, materials, and equipment for conducting the required tests.
- 5. The Contractor shall notify the Contract Administrator, in writing, at least two weeks prior to the date which commissioning activities will commence.
- 6. Any defects which become evident during commissioning shall be immediately corrected at the Contractor's expense and the test repeated until the work is proven satisfactory by the Contract Administrator.
- 7. Testing, at a minimum, shall prove the following:
 - a. All mechanical and electrical equipment affected by the work operate correctly and satisfactorily.
 - b. Control devices operate correctly and satisfactorily.
 - c. All circuits, controls and interlock sequences of operation are correct.
 - d. All protective and indicating devices operate satisfactorily.
 - e. Motor running currents under no load (decoupled motor) and full load are within acceptable ranges.
- 8. The Contractor is responsible for submitting the Operation and Maintenance (O&M) Manuals in accordance with the technical specifications.
- 9. The Contractor shall coordinate commissioning of the new equipment and systems with the OEM in the factory and on-site start-up.
- 10. Upon total completion of the commissioning the final hand-over package shall be submitted by the Contractor to the Contract Administrator. It shall include all as-built drawings, factory acceptance tests (in-factory and on-site), Testing and Balancing (TAB) reports, equipment settings, lubricant schedules, installation records, warranty information, preventative maintenance schedule for equipment and components, pre-commissioning and commissioning records, and performance verification records.
- 11. Upon completion of Performance Verification, the Contractor shall submit:
 - i. Completed form CD-PM-TO-16 Certificate of Equipment Satisfactory Performance Form 103 (see Appendix B).
 - ii. Complete form CD-PM-TO-17 Certificate of Satisfactory Process Performance Form 104 (see Appendix B).

The detailed commissioning tasks are outlined below. For each of the tasks, detailed procedure and record sheets will be provided or developed to document the commissioning of the mechanical and electrical equipment. The Contract Administrator will monitor the commissioning activities as specified in Section 2.0; and upon satisfactory completion of the commissioning, will review the documentation provided by the Contractor. The Contractor shall be responsible for performing all commissioning and performance verification tests, under the direction of the Contact Administrator.



TABLE 2MECHANICAL EQUIPMENT AND SYSTEMS TO BE COMMISSIONED

Item	Equipment Type	Tag	Applicable Commissioning Documents
1	Boilers	BLR-B0005, BLR- B0006, BLR-B0007	System Verification Forms (Appendix B) City of Winnipeg Forms Equipment Vendor Forms
2	Circulation Pumps	P-B0110, P-B0120, P-B0130, P-B0140	System Verification Forms (Appendix B) City of Winnipeg Forms Equipment Vendor Forms
3	Low Flow Circulation Pump	P-B0150	System Verification Forms (Appendix B) City of Winnipeg Forms Equipment Vendor Forms
4	Digester and Natural Gas Safety Shutoff Valves (Boilers 1 and 2)	N/A	System Verification Forms (Appendix B) City of Winnipeg Forms Equipment Vendor Forms
5	Nitrogen Gas System	N/A	City of Winnipeg Forms

TABLE 3

ELECTRICAL EQUIPMENT AND SYSTEMS TO BE COMMISSIONED

Item	Equipment Type	Тад	Applicable Commissioning Documents		
1	Circulation Pump VFDs	VFD-B0110, VFD- B0120, VFD-B1030	System Verification Forms (Appendix B) City of Winnipeg Forms Equipment Vendor Forms		
2	Motor E-Stop Switch	HSS-B01100, HSS- B01200, HSS- B10300	System Verification Forms (Appendix B) City of Winnipeg Forms Equipment Vendor Forms		
3	Boiler E-Stop Switch	HSS-B00515, HSS- B00516	System Verification Forms (Appendix B) City of Winnipeg Forms		
4	Flowmeters	FE-B00050, FE- B00051, FE- B00052, FE- B00060, FE- B00061, FE-B00062	System Verification Forms (Appendix B) City of Winnipeg Forms		
5	Boiler 5 Circuit Breaker	CB-B0005	System Verification Forms (Appendix B) City of Winnipeg Forms		
6	Boiler 6 Circuit Breaker	CB-B0006	System Verification Forms (Appendix B) City of Winnipeg Forms		



Item	Equipment Type	Tag	Applicable Commissioning Documents		
7	Circulation Pump Circuit Breaker	CB-B0110, CB- B0120, CB-B0130, CB-B0140	System Verification Forms (Appendix B) City of Winnipeg Forms		
8	Flow Switches FS-B00519, FS- B00619		System Verification Forms (Appendix B) City of Winnipeg Forms		
9	MCC	MCC-B7001 and MCC-B7002	System Verification Forms (Appendix B) City of Winnipeg Forms Equipment Vendor Forms		

4.3 Mechanical Commissioning Works

The Contractor shall perform the following pre-commissioning, commissioning and performance verification activities. This list is not exhaustive, and the Contractor may be required to perform additional tasks, other than what is described below to ensure the new boilers and associated systems operate satisfactorily.

4.3.1 PRE-COMMISSIONING

- Provide on-site boiler start-up and commissioning by boiler manufacturer (or authorized agent). Manufacturers shall commission the integral boiler controls and safety systems, including systems for the natural gas and digester gas trains.
- 2. Perform all required factory and pre-startup testing according to manufacturer's instructions. Submit Factory Acceptance Testing to Contract Administrator, prior to boiler on-site commissioning.
- 3. Obtain all necessary approvals from Authority Having Jurisdiction (Inspection and Technical Services Manitoba) for installed boilers and piping.
- 4. Ensure all associated piping systems are installed and tested as per the specifications. Including hydrostatic pressure testing for new hydronic, nitrogen, natural gas, and digester gas piping systems in accordance with technical specification Section 23 21 13.02.
- 5. Ensure all equipment to be pre-commissioned is installed.
- 6. Verify all equipment installed is accessible for maintenance, clean, safe and free of defects.
- 7. Ensure all associated piping supports are installed, and penetrations are sealed.
- 8. Ensure all equipment is properly lubricated and have associated safety guards in place.
- 9. Manually test all valves to ensure for proper range in operation and isolation of service.
- 10. Ensure all power and control wiring to equipment, instrumentation and other devices affected by the MCC replacement and boiler installation are complete.
- 11. Ensure all instrumentation (ie: temperature transmitters, flow switches, etc.) are calibrated at the device and scaled appropriately within the plant control system.



4.3.2 COMMISSIONING TASKS - BLR-B0005, BLR-B0006, BLR-B0007

- 1. Perform boiler heating loop temperature control testing in accordance with system verification commissioning forms (see Appendix B).
- 2. Perform boiler loss of power testing in accordance with system verification commissioning forms (see Appendix B).
- 3. Perform boiler low water testing in accordance with system verification commissioning forms (see Appendix B).
- 4. Perform boiler high limit testing in accordance with system verification commissioning forms (see Appendix B).
- 5. Perform boiler E-stop testing in accordance with system verification commissioning forms (see Appendix B).
- 6. Perform boiler control system testing in accordance with system verification commissioning forms (see Appendix B).
- 7. Perform all other testing and inspection requirements in accordance with technical specification section 23 52 00 Heating Boilers.

4.3.3 COMMISSIONING TASKS - P-B0110, P-0120, P-B0130, P-B0140, P-B0150

- 1. Perform pump functional testing in accordance with system verification commissioning forms (see Appendix B).
- 2. Perform pump control system testing in accordance with system verification commissioning forms (see Appendix B).
- 3. Test circulation pump (P-B0110, P-B0120, P-B0130) low flow and high flow rate functionality with the PCS (see Appendix B).

4.3.4 PERFORMANCE VERIFICATION

- Perform Testing Adjusting and Balancing (TAB) in accordance with technical specification section 23 05 93.
- 2. Verify the boilers, pump and associated equipment are functioning as intended during normal plant operations for a minimum of 3 days.
 - a. Complete form CD-PM-TO-16 Certificate of Equipment Satisfactory Performance Form 103 see Appendix B).
 - b. Complete form CD-PM-TO-17 Certificate of Satisfactory Process Performance Form 104 (see Appendix B).

Refer to Appendix B for relevant commissioning forms to be employed during commissioning. Any forms not provided that are necessary to show completion of the tasks described shall be developed by the Contractor in an organized fashion, in a computer-generated format.



4.4 Electrical Commissioning Works

The Contractor shall perform the following pre-commissioning, commissioning and performance verification activities. This list is not exhaustive, and the Contractor may be required to perform additional tasks, other than what is described below to ensure the new boilers and associated systems operate satisfactorily.

4.4.1 PRE-COMMISSIONING

- 1. Perform loop wiring checks for each instrument or device as outlined in Appendix B.
- 2. Perform loop wiring checks for each existing instrument or device connected to MCC-B7001 and MCC-B7002 as outlined in Appendix B.
- 3. Record as-built wiring information in the I/O List and Cable List included in Appendix E.
- 4. Perform instrument calibration for each instrument as outlined in Appendix B.
- 5. Establish and verify network communications for all new networked devices including but not limited to: the new network switch, MCC power meters, VFDs, and boiler control panel.
- 6. Verify that all motors supplied by MCC-B7001 and MCC-B7002 rotate in the correct direction and operate in both automatic and manual modes as required.
- 7. Verify that all non-motor loads supplied by MCC-B7001 and MCC-B7002 are energized and drawing similar current when previously connected to MCC-1B and MCC-2B.

4.4.2 COMMISSIONING TASKS - MCC-B7001, MCC-B7002

- 1. Perform MCC functional testing in accordance with system verification commissioning forms (see Appendix B).
- 2. Perform motor functional testing for all motors (existing and new) powered by the MCCs in accordance with system verification commissioning forms (see Appendix B).

4.4.3 COMMISSIONING TASKS

- 1. Verify that range specified in plant PCS matches range of the instrument for each instrument as outlined in Appendix B. Coordinate with the City.
- 2. Verification of read-out on plant PCS for 0%, 50%, and 100% signals for each instrument as outlined in Appendix B. Coordinate with the City.
- 3. Verify operation of all hand switches.
- 4. Verify correct operation of all pump and boiler interlocks.

4.4.4 PERFORMANCE VERIFICATION

- 1. Verify the boiler control system is functioning as intended during normal plant operations.
 - a. Complete form CD-PM-TO-16 Certificate of Equipment Satisfactory Performance Form 103 see Appendix B).
 - b. Complete form CD-PM-TO-17 Certificate of Satisfactory Process Performance Form 104 (see Appendix B).



Refer to Appendix B for relevant City of Winnipeg Electrical Checklists to be employed during commissioning. Any forms not provided that are necessary to show completion of the tasks described shall be developed by the Contractor in an organized fashion, in a computer-generated format.

4.5 City of Winnipeg Forms 100 to 104 Intent

As part of the pre-commissioning and commissioning phases for this project, the City of Winnipeg Forms 100 to 104 shall be filled out in addition to the documentation provided by the Contract Administrator. Contractor and equipment vendors. These forms are included within Appendix B for reference and are listed below with a brief description.

- Form 100 Certificate of Equipment Delivery
 - Intended to document when all major equipment has been received onsite. The list of major equipment shall include all associated equipment tags throughout the Contract Documents.
 - This list shall be finalized between the Contract Administrator, City of Winnipeg and Contractor during the construction period.
- Form 101 Certificate of Readiness to Install
 - Intended to document that the installing Contractor is familiar with the associated equipment/system to be installed.
 - This certificate shall confirm the installing Contractor is fully aware of the scope outlined in the Contract Documents and any specific equipment/system vendor installation requirements.
- Form 102 Certificate of Satisfactory Installation
 - Intended to document that the equipment/system was installed to the satisfaction of the equipment/system vendor/supplier and the Contract Administrator after a detailed inspection has taken place.
 - The Contractor shall coordinate with Contract Administrator to schedule these inspection dates during the Construction.
 - The Contractor shall also arrange and document any specified tests to demonstrate the equipment/system was installed satisfactory.
- Form 103 Certificate of Equipment Satisfactory Performance
 - Intended to document that the equipment/system has performed for a minimum 3 days continuously with no issues utilizing the specified test fluid/material.
 - The Contractor shall coordinate with Contract Administrator to schedule these inspection dates during the Construction.
 - The Contractor shall arrange, and document specified testing and measurement of the equipment/system performance to demonstrate that the design criteria were met.
- Form 104 Certificate of Satisfactory Process Performance
 - Intended to document that the equipment/system has performed satisfactorily for a continuous period with the specified process fluid/material. This period shall be established by the Contract Administrator during construction.
 - The Contractor shall coordinate with Contract Administrator and City of Winnipeg to schedule these inspection/witness dates during the Construction.



- The Contractor shall arrange, and document specified testing and measurement of the equipment/system performance to demonstrate that the design criteria were met.
- The Contractor shall complete commissioning documentation to record equipment/system operating parameters that demonstrate satisfactory performance. Any deficiencies and corrective actions shall be documented through the Commissioning Log in Appendix C and issued to the Contract Administrator.
- The City of Winnipeg shall provide any existing system monitoring and data points for coordination with the Contract Administrator and Contractor to allow for confirmation of satisfactory process performance.



5.0 TRAINING

Training classes will be presented by the Contract Administrator and the Contractor at the NEWPCC boardroom for City personnel. The Contract Administrator is responsible for the coordination, quality assurance, overall packaging, and presentation of the training sessions. Training sessions shall be provided in accordance with Section **01 79 00** – **Demonstration and Training** and **Appendix V** – **Training Requirements**. (Where discrepancies exist between the Commissioning Plan, Section 01 79 00, and Appendix V, most stringent requirements shall be provided.)

The Contract Administrator will provide a general description of the new systems, including the design philosophy, criteria, and intent. The Contractor will instruct City personnel how to operate the new equipment and control systems safely, and reliably. The Contractor will also instruct equipment maintenance requirements along with diagnosis and trouble-shooting information.

The Contract Administrator and Contractor (in coordination with associated subtrades and vendors) will provide training material in advance of training sessions for review and approval by the City. Final review and approval of all training manuals and materials is required by the City of Winnipeg prior to the training sessions. It is assumed that feedback will be provided in a timely manner and that scheduling of the training sessions in conjunction with commissioning work will not be delayed.

Technical memoranda prepared by the Contractor will be provided following the commissioning/training workshops. The City will be responsible for providing appropriate personnel to participate in the training for the operation and maintenance of the facility.

The Contract Administrator will provide a general overview of the systems only. The Contractor's individual equipment instructors will be responsible for the content and quality of their respective sections. The Contractor and any required certified factory-trained manufacturers' personnel will provide specific instruction on the start-up, operation and shut-down of their equipment with emphasis on the components, control features, servicing and maintenance. Specifically, training for the operation and maintenance of the Automation System including the HMI is required. It is expected that the Contractor will provide instruction on the operation of the HMI system.

5.1 Training Session Objectives

The objectives of the training will be to provide City personnel with the following information:

- A description of the function and design of the boiler system.
- An overview of the function requirements of the system.
- A detailed description of the extent of all structural, electrical, and mechanical work performed.
- A review of the system layout, the equipment, controls and emergency shut off.
- Equipment and system start-up, operation, monitoring, servicing (including trouble-shooting diagnosis), maintenance and shut-down procedures.



- System operating sequences, including step-by-step directions for starting, operating and shutting down applicable switches and control settings.
- Recommended preventative maintenance practices along with diagnosis and trouble-shooting information.
- A review of O&M Manual documentation

Additionally, commissioning workshops will be held to train plant staff on the operation and maintenance of the new upgraded facilities and equipment. Training sessions/workshops are to be video recorded by the Contractor and submitted to the Contract Administrator for review. The Contract Administrator will provide the video records to the City to serve as documented record. (Refer to Appendix V for additional information.)



6.0 O&M MANUAL

Upon completion of the project, the Contractor shall provide a complete set of information (the "Operation and Maintenance Information" or "O&M Information") to furnish City staff with all the information required to operate and maintain the Project. O&M Manual shall comply with the requirements of Appendix P – Operations Manual Specification and Appendix Q – Operations and Maintenance Information.

A draft of the O&M manual will be provided to the City prior to commissioning. Final review and approval of all operation and maintenance (O&M) manuals and materials will be required by the City prior to the training sessions. Recommended Preventative Maintenance procedures will be provided by the OEM and Contractor in document format prior to Substantial Completion.

The O&M documentation will be provided in two sections, one containing information furnished by the Contract Administrator, and one containing information provided by the Contractor and will be include the following:

- Consultant:
 - As-built drawings
 - Final Asset Registry
 - Final Construction Report; and
 - Commissioning Records
 - Safe Work Procedures (SWP)
 - Standard Operating Procedures (SOP)
 - Lock Out Tag Out Procedures (LOTO)
- Contractor:
 - "As-Built" contract documents
 - Operating Manuals
 - Maintenance Manuals
 - Shop Drawings
 - Product Information (PI) sheets
 - Supplemental training materials like presentations, training videos and/or equipment models
 - Video recordings of all training sessions
 - Lubricants Schedule
 - Equipment Maintenance Schedule
 - Set Points for All Assets
 - Spare Parts List for All Assets
 - Equipment Warranty Information
 - Supplier Contact Information

The O&M document package will be provided in electronic and hard copy format.



APPENDIX A

Commissioning Schedule (Preliminary)

DTask NameDurationStartFinishPredecessors'25 May'25 Jul'25 Aug'25 Aug'25 Oct'25 Nov'25 Doc'26 Jan'26 Jan <th< th=""><th>eb '26 N 18 15 22 01 04</th></th<>	eb '26 N 18 15 22 01 04
1AWARD OF CONTRACT1 dayFri 25-05-16Fri 25-05-16I2Mechanical Procurement31 daysMon 25-05-19Mon 25-06-3013Electrical Procurement31 daysTue 25-05-20Tue 25-07-0114Early Construction Work (May - Sept.)98 daysMon 25-05-19Med 25-10-015Asbestos Abatement15 daysMon 25-05-19Fri 25-06-0616Demolition of Existing Boiler 5 and Associated Piping79 daysTue 25-09-305S	
2Mechanical Procurement31 daysMon 25-05-19Mon 25-06-3013Electrical Procurement31 daysTue 25-07-20Tue 25-07-0114Early Construction Work (May - Sept.)98 daysMon 25-05-19Wed 25-10-01I5Asbestos Abatement15 daysMon 25-05-19Fri 25-06-0616Demolition of Existing Boiler 5 and Associated Piping79 daysThu 25-06-12Tue 25-09-305	
3 Electrical Procurement 31 days Tue 25-05-20 Tue 25-07-01 1 4 Early Construction Work (May - Sept.) 98 days Mon 25-05-19 Wed 25-10-01 Image: Construction Work (May - Sept.) 98 days Mon 25-05-19 Fri 25-06-06 1 Image: Construction of Existing Boiler 5 and Associated Piping 79 days Thu 25-06-12 Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping 79 days Thu 25-06-12 Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and Associated Piping Tue 25-09-30 5 Image: Construction of Existing Boiler 5 and	
4 Early Construction Work (May - Sept.) 98 days Mon 25-05-19 Wed 25-10-01 Image: Construction Work (May - Sept.) Image: Construction Work (May - Sept.) 5 Asbestos Abatement 15 days Mon 25-05-19 Fri 25-06-06 1 6 Demolition of Existing Boiler 5 and Associated Piping 79 days Thu 25-06-12 Tue 25-09-30 5	
5 Asbestos Abatement 15 days Mon 25-05-19 Fri 25-06-06 1 6 Demolition of Existing Boiler 5 and Associated Piping 79 days Thu 25-06-12 Tue 25-09-30 5	
6 Demolition of Existing Boiler 5 and Associated Piping 79 days Thu 25-06-12 Tue 25-09-30 5	
7 Removal of Existing Boiler 5 Complete (CRITICAL STAGE) 0 days Wed 25-10-01 Wed 25-10-01 6	
8 Upsizing Natural Gas Piping 60 days Mon 25-06-09 Fri 25-08-29 5	
9 Upsizing Natural Gas Piping Complete (CRITICAL STAGE) 0 days Fri 25-08-29 Fri 25-08-29 8	
10 Relocation of Nitrogen Tanks to Main Boiler Room 83 days Mon 25-06-09 Wed 25-10-01 5	
11 Relocation of Nitrogen Tank Complete (CRITICAL STAGE) 0 days Wed 25-10-01 10	
12 HWR and HWS Hot Tap Tie-ins 35 days Mon 25-07-14 Fri 25-08-29	
13 Middle Construction Works (OctMar.) 130 days Wed 25-10-01 Tue 26-03-31 4	
14 New Equipment Footing, Racks, Supports 25 days Wed 25-10-01 Tue 25-11-04	
15 Pipe rough-in for boilers and pumps 105 days Wed 25-11-05 Tue 26-03-31	
16 Hot Water Return 105 days Wed 25-11-05 Tue 26-03-31 14	
17 Hot Water Supply 105 days Wed 25-11-05 Tue 26-03-31 14	
18 Natural Gas 105 days Wed 25-11-05 Tue 26-03-31 14	
19 Digester Gas 105 days Wed 25-11-05 Tue 26-03-31 14	
20 Installation of New Hot Water Circulation Pump 27 days Mon 26-01-05 Tue 26-02-10	
21 Electrical and Control System Installation 105 days Wed 25-11-05 Tue 26-03-31 14	
22 Structural Work 50 days Wed 25-11-05 Tue 26-01-13 14	
23 Late Construction Works (AprMay.) 55 days Wed 26-04-01 Tue 26-06-16	
24 Demolition of Existing Interim Boilers 5A and 5B 30 days Wed 26-04-01 Tue 26-05-12 13	
25 Structural Construction Works 30 days Wed 26-04-01 Tue 26-05-12 13	
26 Installation of New Boilers 30 days Wed 26-04-01 Tue 26-05-12 13	
27 Electrical and Control System Installation 30 days Wed 26-04-01 Tue 26-05-12 13	
28 Staged Demolition of Existing MCC-1B and MCC-2B 30 days Wed 26-04-01 Tue 26-05-12 13	
29 Staged Installation of New MCC-B7001 and MCC-B7002 30 days Wed 26-04-01 Tue 26-05-12 13	
30 Piping tie-ins 10 days Wed 26-05-13 Tue 26-05-26 27	
31 Hot Water Return 10 days Wed 26-05-13 Tue 26-05-26 29	
32 Hot Water Supply 10 days Wed 26-05-13 Tue 26-05-26 29	
33 Natural Gas 10 days Wed 26-05-13 Tue 26-05-26 29	
34 Digester Gas 10 days Wed 26-05-13 Tue 26-05-26 29	
35 Piping Insulation 15 days Wed 26-05-27 Tue 26-06-16 30	
36 Electrical Tie-ins 15 days Wed 26-05-27 Tue 26-06-16 30	
37 Pre-Commissioning (lun -lul) 9 days Wed 26-06-17 Mon 26-06-29	
38 Mechanical Equipment Pre-Commissioning Checks 9 days Wed 26-06-17 Mon 26-06-29 23	
39 AHLInspection Approval 9 days Wed 26-06-17 Mon 26-06-29 23	
40 Commissioning (lun -lul) 40 days Mon 26-06-08 Eri 26-07-31	
41 Pine Pressure and Leak Testing 14 days Tue 26-06-30 Fri 26-07-31	
41 Hiperressure and Leak resting 14 days Ide 20/00/00 57 42 Vonder Start un 10 days Mon 26.07.06 Fri 26.07.17 57	
42 Vendol State-up 10 days 10 days 10 days 11 20-07-00 11 20-07-17	
43 Electrical Point, Loop Clecks and Weggering Tests 14 days Wolf 200008 Thu 2000023	
44 Testing and balancing (TAB) 14 days 10e 20-00-50 FIT 20-07-17	
46 System Performance Verification 15 days Mon 26 07 12 Fri 26 07 21	
To System renormance vernication 15 udys Iviol1 20-07-35 47 Training 10 days Non 26 09 02 Eri 26 09 14 46	
Training TO Udys IVIUII 20-06-05 FII 20-00-14 40 48 Contificate of Substantial Deformance 0 days Exi 26:08:28 54 26	
How Certificate of Total Performance U days FII 2b-U8-28 40 Cortificate of Total Performance 0 days Eri 26 10 16	
Project: NEWPCC Boiler 5 Task Summary Inactive Milestone 🔷 Duration-only External Milestone Inactive Milestone	
Replacement 2025-2026 Split Project Summary Inactive Summary Manual Summary Rollup Finish-only Deadline	
Date: March 24, 2025 Milestone Inactive Task Manual Task Manual Summary External Tasks Progress	
Page 1	



APPENDIX B

Pre-Commissioning and Commissioning Forms

1_Pre-Commissioning Forms





Form 100 CERTIFICATE OF EQUIPMENT DELIVERY

We certify that the equipment listed below has been delivered into the care and custody of the Installation Contractor. The equipment has been found to be in satisfactory condition. There is no visible evidence of exterior damage or defects.

Project: Equipment Description: Equipment Supply Bid Opp. No.: Equipment Install Bid Opp. No.: Equipment Tag No.: Specification Reference:

(Authorized Representative of Supply Contractor)

(Authorized Representative of Install Contractor)

(Authorized Representative of Contract Administrator)

Date

Date

Winnipeg Water and Waste Department • Service des eaux et des déchets

Form 101 CERTIFICATE OF READINESS TO INSTALL

We have familiarized the installing contractor of the specific requirements related to the equipment listed below and am satisfied that the installing contractor understands the required installation procedures.

Project: Equipment Description: Equipment Supply Bid Opp. No.: Equipment Install Bid Opp. No.: Equipment Tag No.: Specification Reference:

(Authorized Representative of Supply Contractor)

We certify that we have received satisfactory installation instructions from the equipment manufacturer/vendor.

CD-PM-TO-14 Certificate of Readiness to Install Form 101.docx

(Authorized Representative of Install Contractor)

Date



Form 102 CERTIFICATE OF SATISFACTORY INSTALLATION

We have completed our checks and inspection of the installation of our equipment as listed below and confirm that it is satisfactory and that any defects have been remedied except any as noted below.

Project: Equipment Description: Equipment Supply Bid Opp. No.: Equipment Install Bid Opp. No.: Equipment Tag No.: Specification Reference: Outstanding Defects:

(Authorized Representative of Supply Contractor)

(Authorized Representative of Install Contractor)

(Authorized Representative of Contractor Administrator)

Date

Date



Form 103 CERTIFICATE OF EQUIPMENT SATISFACTORY PERFORMANCE

We certify that the equipment listed below has been continuously operated for a minimum of three (3) consecutive days and that the equipment operates satisfactorily and meets it's specified operating criteria. No defects in the equipment were found and as such are classified as "conforming".

Project: Equipment Description: Equipment Supply Bid Opp. No.: Equipment Install Bid Opp. No.: Equipment Tag No.: Specification Reference:

(Authorized representative of Supply Contractor)

(Authorized representative of Install Contractor)

(Authorized representative of Contract Administrator)

Date

Date



Form 104 CERTIFICATE OF SATISFACTORY PROCESS PERFORMANCE

We certify that the process system listed below has been continuously operated and tested as per the Specifications using process fluid and that the equipment meets its Performance Testing and Operating Criteria. No defects in the process system were found and as such are classified as "conforming".

Project: Equipment Description: Equipment Supply Bid Opp. No.: Equipment Install Bid Opp. No.: Equipment Tag No.: Specification Reference:

(Authorized Representative of Supply Contractor)

(Authorized Representative of Install Contractor)

(Authorized Representative of Contract Administrator i.e. Commissioning Lead or Design Discipline Lead)

(Authorized Representative of City)

Date

Date

Date



ELECTRICAL PRE-COMMISSIONING CHECKLIST



PROJECT			
Facility: NEWPCC Project Name: NEWPCC Boiler Replacement 2025			
Area: B	Bid Opportunity:277-2025		

	l	nstrument/D	evice Loop Verif	ication Checks		
Device Tag	Control Panel Tag	Pass/Fail	Tes	ted By	Signature	Date
		[P/F]	Company	Name		(YYYY-MM-DD)
FIT-B00050	CP-B8001					
FIT-B00051	CP-B8001					
FIT-B00052	CP-B8001					
FIT-B00060	CP-B8001					
FIT-B00061	CP-B8001					
FIT-B00062	CP-B8001					
HSS-B000515	BLR-B0005 CONTROL PANEL					
PIT-B000516	BLR-B0005 CONTROL PANEL					
PIT-B000517	BLR-B0005 CONTROL PANEL					
AE-B000518	BLR-B0005 CONTROL PANEL					
FS-B000519	BLR-B0005 CONTROL PANEL					
HSS-B000615	BLR-B0006 CONTROL PANEL					
PIT-B000616	BLR-B0006 CONTROL PANEL					
PIT-B000617	BLR-B0006 CONTROL PANEL					
AE-B000618	BLR-B0006 CONTROL PANEL					
FS-B000619	BLR-B0006 CONTROL PANEL					
HSS-B000615	BLR-B0006 CONTROL PANEL					
HSS-B01100	VFD-B0110					
HSS-B01200	VFD- B0120					

HSS-B01300	VFD- B0130			
HV-B110A	BOILER 1 CONTROL PANEL			
HV-B110B	BOILER 1 CONTROL PANEL			
HV-B111A	BOILER 1 CONTROL PANEL			
HV-B111B	BOILER 1 CONTROL PANEL			
HV-B210A	BOILER 2 CONTROL PANEL			
HV-B210B	BOILER 2 CONTROL PANEL			
HV-B211A	BOILER 2 CONTROL PANEL			
HV-B211B	BOILER 2 CONTROL PANEL			
ESL-B70012	CP-B8001			
ESL-B70022	CP-B8001			
XS-B70011	CP-B8001			
XS-B70021	CP-B8001			

Instrument Calibration						
Instrument Tag	Signal	[Unit]	Tested By		Signature	Date
	4 mA	20 mA	Company	Name		(YYYY-MM-DD)
FIT-B00050						
FIT-B00051						
FIT-B00052						
FIT-B00060						
FIT-B00061						
FIT-B00062						

I/O Loop Verification Checks						
Device Tag	Control Panel	Pass/Fail	Test	Tested By		Date
	Tag	[P/F]	Company	Name		(YYYY-MM-DD)

	٢		PRE-C	OMMISSIONIN	G FORM	Page 1 of 2
	Winnipeg		EQUIPME	ENT INSPECTIC	System Title:	
ject	Facility: NEWPCC		ж С	Project Name:	NEWPCC Boiler Replace	ement 2025-2026
Pro	Area:	ea: B			277-2025	

	Nameplate Information							
	Equipment Tag:	BLR-B0005	PID: 23-01	07-010_PB_M6-07	Loootion	Poilor 5 Doom		
	Equipment Type:	Boiler			Location:	Boller 5 Room		
	Specifications:	Specif	ed Product	Shop I	Drawings		Installed	
	Manufacturer							
	Model							
	Serial No.							
	Heating Capacity (BTUH):							
	Inlet Supply Pressure (psig)							
:6	Boiler Capacity Output (BHP)							
	Electrical (V/Ph/Hz):							
estii	Checklist		Complete	N/A				
Ĕ	No Physical Dan							
	Equipment vend							
	Electrical power							
	Control loop test	for equipment cor	trol points and ala	ms.				
	Bump test perfor	rmed to confirm blo	ower motor rotation	is correct.				
	TAB completed	and submitted.						
	Associated pipin	ig systems are inst	alled, tested and le	ak checked.				
	Natural gas pipir	ng installed and tes	ited.					
	Digester gas pip	ing installed and te	sted.					
	Correct direction	n of flow.						
	Boiler has adequ	uate service space	to maintain minimu	um clearances.				
	Correct identifica	ation tag.						
	Proper support/r	nounting.						
	Flexible connect	ions installed.						
	Drain piping inst	alled						
	Chimney installe	ed.						

	٢		PRE-C	OMMISSIONIN	G FORM	Page 2 of 2	
Winnipeg			EQUIPME	ENT INSPECTIC	N – Boiler	System Title:	
ject	Facility:	NEWPCC		Project Name:	NEWPCC Boiler Replacement 2025-2026		
Pro	Area:	В		Bid Opportunity:	277-2025		

Roof penetration		
Insulation installe	d.	
Other:		
Comments:		

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

	٢		PRE-C	OMMISSIONIN	G FORM	Page 1 of 2
	Winnipeg		EQUIPME	ENT INSPECTIC	DN – Boiler	System Title:
ject	Facility: NEWPCC		ж С	Project Name:	NEWPCC Boiler Replace	ement 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

	Nameplate Information									
	Equipment Tag:	BLR-B0006	PID: 23-	0107-010_PB_M6-08	Loootion	Beiler & Deem				
	Equipment Type:	Boiler			Location.	Boller 5 Koolli				
	Specifications:	Specifi	ed Product	Shop	Drawings		Installed			
	Manufacturer									
	Model									
	Serial No.									
	Heating Capacity (BTUH):									
	Inlet Supply Pressure (psig)									
	Boiler Capacity Output (BHP)									
:6u	Electrical (V/Ph/Hz):									
esti	Checklist	Checklist								
F -	No Physical Dan									
	Equipment vend									
	Electrical power									
	Control loop test	for equipment con	trol points and a	larms.						
	Bump test perfor	rmed to confirm Mo	otor rotation is co	prrect.						
	TAB completed a	and submitted								
	Associated pipin	g systems are inst	alled, tested and	leak checked.						
	Natural gas pipir	ng installed and tes	ted.							
	Digester gas pip	ing installed and te	sted.							
	Correct direction	of flow.								
	Boiler has adequ	late service space	to maintain mini	mum clearances.						
	Correct identifica	Correct identification tag.								
	Proper support/r	nounting.								
	Flexible connect	ions installed.								
	Drain piping inst	alled								
	Chimney installe	ed.								

	٢		PRE-C	OMMISSIONIN	G FORM	Page 2 of 2	
	Winnipeg		EQUIPME	ENT INSPECTIO	System Title:		
ject	Facility:	NEWPCC		Project Name:	NEWPCC Boiler Replacement 2025-2026		
Pro	Area:	в		Bid Opportunity:	277-2025		

Roof penetration		
Insulation install		
Other:		
Comments:		

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

					PRE-C	OM		SION					Page	1 of 2		
	Vinnipeg				MOTO			IRU					ID:			
oject	Facility:	NE	WPCC				Pro	oject N	lame	e: NEWPCC	Boiler R	eplacen	nent 202	25-2026		
ā	Area :	В					Bio	d Oppo	ortun	iity: 277-2025						
	MCC Equipm	ent No.	: MCC-				L	ocatior	n: E	Boiler Room			N	o. of Sec	ctions:	
	Manufacturer	:					Ν	Nodel:				Serial I	No:			
	Rated Voltage	e:	V	Verti	ical Bus:		A		Ho	orizontal Bus:		A	W	ithstand	k	AIC
	Copper Bu	JS	🗌 3 Wire	e	Botto	m En	try	[_ т	op Entry	Service	Entranc	e Rated	l:	🗌 Yes	🗌 No
	🗌 Aluminum	Bus	🗌 4 Wire	э	Control \	/oltag	je:				Neutral	Bus			🗌 Yes	🗌 No
MCC Data	☐ Main Brea Frame: Trip: A	ker Settings: A L: I:			S: G <u>:</u>	_	Trip	Plug: .I .SI .SIG	ſ	Manufacturer:	Mod	lel:				
	🗌 Main Lugs	, ☐ Main Fuse Trip: A														
	☐ Alternative Circuit Feed Frame: Trip: A	A	Settings: L: I:		S: G <u>:</u>	-	Trip	Plug: .I .SI .SIG	r	Manufacturer:	Mod	lel:				
				•												
	Identification ⁻	Tag Ins	talled:			□ Y	es	ΠN	0	Visual Signs of	Overheat	ting:			🗌 Yes	🗌 No
	Visual signs o	Visual signs of Moisture:					es	🗆 N	0	Visual Signs of	Corona:				🗌 Yes	🗌 No
	Exercise loca	I hand s	switches:			ΠY	es	🗆 N	0	Cables Support	ed Appro	priately	:		🗌 Yes	🗌 No
	Power Cables	s Labele	ed at Both	Ends	:	□ Y	es	🗆 N	0	Control Cables	Labeled	at Both	Ends:		🗌 Yes	🗌 No
	All Pilot Devic	e Lama	acoids Inst	alled		ΠY	es	🗆 N	0	All Bucket Lama	acoids In:	stalled			🗌 Yes	🗌 No
~	Power Cable	Connec	ctions:	🗌 Go	ood 🗌 A	Accep	table	e □ P	oor	Control Cable C	Connectio	ns:	🗌 Goo	A 🗌 bc	cceptable	Poor
aninç	All instrument	ts work:		G	ood 🗌 A	Accep	table	e □ P	oor	Ground Connec	tion:		Goo	od 🗌 A	cceptable	Poor
/ Cle	Door fastener	rs:		G	ood 🗌 A	Accep	table	e □ P	oor	Elec/Mech Inter	locks:		🗌 Goo	A 🗌 bc	cceptable	Poor
ectior	All doors clos	ed secu	urely:	G	ood 🗌 A	Accep	table	∋ 🗌 P	oor	Required cleara	inces me	t:	🗌 Goo	od 🗌 A	cceptable	Poor
lnsp	Cleanliness (/	As Four	nd):	G	ood 🗌 A	Accep	table	€	oor	Vents/Filter Cor	nditions:		Goo	A 🗌 bc	cceptable	Poor
/isual	Enclosure see manufacturer	instruc	o floor/wall tions:	as pe	er		Yes		No	Enclosure free of scratches/dents	of ::		Goo Goo	od 🗌 A	cceptable	Poor
	Horizontal bu	sbar tor	qued:				Yes		No	Touchup paint a	applied to	scratch	nes/chip	s	🗌 Yes	🗌 No
	Vertical busba	ar torqu	ed:				Yes		No	Overload setting	gs agree	with loa	d FLA		☐ Yes	🗌 No
	Set screws to	orqued:			T		Yes		No	Overcurrent set and drawings	tings mat	tch final	arc flas	h study	☐ Yes	🗌 No
	Splice bars to	orqued:			□ N/A		Yes		No	Exercise all circ operating mech	uit break anisms:	ers, diso	connects	s and	🗌 Yes	🗌 No
	Adjust and tes	st grour	nd fault dev	vice	□ N/A		Yes	1 []	No	Exercise all electronic breakers, discontre mechanisms:	ctrically onnects ar	perated nd opera	circuit ating	□ N/A	Yes	No

Winnipeg

Г

PRE-COMMISSIONING FORM MOTOR CONTROL CENTRE

Page 2 of 2

ID:

Comments			

	S Test Preparation: [[Source Disc Con	: connected nected with Source	Ca Isolated	ble Destinat Disconnecto Connected	ion/Load: ed with Source	e Isolated	Note: Approval of City's Representative is required, prior to leaving cables connected during the test.
L L	Equipment Tempera	ature:		°C	Temperat	ure Correct to 20°C:	ion Factor	
esistance Tes	Test		Voltage	Insulation Resistance (MΩ)			Ground all phases not under test. Refer to manufacturer instructions for additional MCC devices to be disconnected prior to using megohmmeter.	
on Re		MCC Vertical Bus Phase to Ground			Phase A	Phase B	Phase C	Test Summary
ulati	MCC Vertical B							Test Passed
lns	MCC Vertical Bus Phase to Phase						Test Inconclusive Further Investigation Required.	
	MCC Horizontal	Bus Ph	ase to Ground					☐ Test Failed
	MCC Horizontal	Bus Pl	hase to Phase					
	Comments:						-	

is	Returned to Service:	🗌 Yes	🗌 No	Comments:
Final	Monitoring / Inspection Required:	🗌 Yes	🗌 No	
Ā	Repair / Replacement Required:	🗌 Yes	🗌 No	

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

				PRE-	сом	MISSIC		1		Page 1	of 1	
	winnipeg	5		мото	R ST	ARTE	R, VFD, BASI	С		ID:		
lect	Facility:	NEWPCC			Pro	ject Nam	e: NEWPC	СВс	oiler Replace	ement 2025-202	6	
Proj	Area:	В			Bid	Opportu	nity: 277-2025	5				
	Land	D			Chart		Anna Main Daila					
	Load:	P-		1	Stan	ter Locati	on: Main Bolle	r R0	om		Cell #:	
	Manufacturer	:		Type:	VFD			Size	: 15HP	Rated Voltage:	600 V	
	MAC Address (Network Driv	s: ves Only)										
Ita			Disc	. Size:		А						
r Da			Fuse	e Size:		А						
tarte	Circuit Protection:	E Fused Disc.	Fuse	e Type:								
S		Breaker	Brea	ker/MCP			Inst.		Manufacture	er:		
		□ МСР	Rati	ng:	A		Setting:	A	Model:			
	Overload	Thermal					Setting /		Manufacture	er:		
	Protection:	Electronic	Clas	s:	30 Unl	known	Rating:	A	Model:			
		•							•			
	Starter Identi	fication Tag Insta	alled:	☐ Yes		🗌 No	Visual Signs of	Ove	erheating:		☐ Yes	🗌 No
	Cleanliness (As Found):	Good 🗌		ptable	Poor	Electro/Mechar Interlock:	nical		Good A	cceptable	Poor
	Connections		🗌 Good		ptable	Poor	Communication	n Ca	ble:	Good A	cceptable	Poor
ing	Ground Conr	nection:	🗌 Good		otable	Poor	Door Mechanic	al:		Good A	cceptable	Poor
Clean	Cables Routed Appropriately:		:	🗌 Yes		🗌 No	Indicating Light	s:		Good A	cceptable	Poor
on / (Line Filtering:		🗌 Yes		🗌 No	H-O-A Switch (Conc	lition:	Good A	cceptable	Poor	
Ispect	Load Filtering	g:		☐ Yes		□ No	Emergency Sto Condition:	р В	utton	Good A	cceptable	Poor
sual Ir	Control Wirin Separated fro	g Connected and om Power Wiring	d Properly j:	☐ Yes		□ No	Speed Potentic Condition:	omet	er	Good A	cceptable	Poor
Š	Evercise Circ	nit.										

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

🗌 Yes

Unit Cleaned:

🗌 Yes

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Exercise Circuit

Comments:

Breaker/MCP/Disconnect:

	Ĩ			PRE-	COMMISSI	ONIN		Λ		Page 1	of 1	
	Winnipeg	5		MOTOR STARTER, FVNR, BAS						ID:		
ject	Facility:	NEWPO	C C		Project Nam	ne:	NEWPC	C Boiler Re	place	ment 2025-202	26	
Pro	Area:	В			Bid Opportu	Bid Opportunity: 277-2025						
											1	
	Load:				Starter Locat	ion:					Cell #	
	Manufacturer			Type:				Size:		Rated Voltage	:	V
	MAC Address (Network Driv	s: ves Only)										
ata		Disconn	Disc	c. Size:	А							
ter D	Circuit	Fused [Fus Disc.	e Size:	А							
Star	Protection:		Fus	e Type:								

А

Inst. Setting:

Manufacturer:

Model:

A

Breaker/MCP

Rating:

Breaker

□ MCP

	Overload	Thermal	Class	□ 10 □ 20		Setting /	۸ ۱	Manufacture	er:		
	Protection:	Electronic	Clas	s: 30 Uni	known	Rating:	A	Model:			
	Starter Identi	fication Tag Insta	alled:	☐ Yes	🗌 No	Visual Signs of Ov	verh	neating:		/es	🗌 No
	Cleanliness (As Found):	Good	Acceptable		Electro/Mechanica Interlock:	al		Good Accep	otable	Poo
_	Connections		Good 🗌	Acceptable		Contactor Condition	ion:		Good Accep	table	Poo
aning	Ground Conr	nection:	Good	Acceptable		· Overload Conditio	on:		Good Accep	table	Poo
/ Cle	Cables Route	ed Appropriately:		□ Yes	🗌 No	Door Mechanical			Good Accep	table	Poo
ction	Exercise Circ	uit Breaker/MCF	/Disconne	ct	🗌 Yes	Unit Cleaned:		Yes			
Visual Inspe	Comments:										

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct. Note:

	Ŵi	miner		PRI POIN	E-COMMIS T TO POIN	SSION	NING IECKS		Page	1 of 1	
	,,,	impeg	ŀ	AUTOMA		ITRO	L CAB	LES	ID:		
ject	Facility	/: NEWPO	C		Project Nam	e:	NEWPO	CC Boiler Replace	ment 202	5-2026	
Pro	Area:	В			Bid Opportu	nity:	277-202	25			
Г											
łuit	Source	ə:			De	st.:					
ble/Conc Data	Installa	ation: Cable	Tray bed	Direct E	Buried	Condu EMT Rigid \$	uit Steel	☐ Alum. ☐ PVC	C] Other:	
Ca	No. of	Pairs:		Size:		AWG	Type:		Rated Vo	oltage:	V
u	Cable	Identification Tag I	nstalled:	Yes 🗌 No	D □ N/A	Encl	osure En	try Acceptable:		☐ Yes	🗌 No
sual	Wire ta	ags installed:		Yes 🗌 No	с С	Con	duit / Cat	ble Supported Appr	opriately:	🗌 Yes	🗌 No
iv Vi	Comm	ients:									
ļ											
	Pair	ID/Devic	e	Cond. 1 t Continui (Pass	o Cond. 2 ty Check s/Fail)	Pa	air	ID/Device		Cond. 1 to C Continuity ((Pass/Fa	ond. 2 Check iil)
	1					1	3				
	2					1.	4				
	3					1	5				
leck	5					1	7				
it Cr	6					1	8				
Poir	7					1	9				
it to	8					2	0				
Poin	9					2	1				
uity	10					2	2				
ntin	11					2	3				
ပိ	12					2	4				
	Comm	ients:									
	Test S	Summary: 🔲 T	est Passed	🗌 Test Fa	ailed						
-	•		I								
		Company	Ν	lame			Signatu	ire		Date (yyyy/m	ım/dd)
Perfo	rmed B	у									

Checked By

	٢		PRE-C	OMMISSIONIN	G FORM	Page 1 of 2
	Winnipeg		EQUIPME		System Title:	
ject	Facility:	NEWPO	c	Project Name:	NEWPCC Boiler Replace	ement 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

Equipment Tag:		PID:					
Equipment Type:				Location:			
Service (Domestic	Water or Hydro	nic): Domestic Water		J			
Specifications:	Specif	ied Product	Shop	Drawings		Installed	
Manufacturer							
Model							
Serial No.							
Motor HP:							
Electrical							
(V/Ph/Hz):							
Checklist						Complete	N//
No Physical Dama	ige						
Equipment vendor	Equipment vendor pre-commissioning is completed.						
Electrical power and control wiring installed and tested.							
Associated piping	connections are	completed.					
Correct direction of	f flow.						
Pump is in accepta	able orientation.						
Motor & pump alig	ned.						
Pump has adequa	te service space						
Temperature and	pressure gauges	installed.					
Valves & Strainers	installed.						
Bearings lubricate	d.						
Correct identificati	on tag.						
Proper support/mounting.							
Bump test perform	ed to confirm Im	peller & Motor rotation i	s correct.				
Bump test perform	ed to confirm Im	peller & Motor rotation i	IS COFFECT.				
Bump test perform	ed to confirm Im	peller & Motor rotation i	IS COFFECT.				
Bump test perform	ed to confirm Im	peller & Motor rotation i	s correct.				
Bump test perform	ed to confirm Im	peller & Motor rotation i	s correct.				
Bump test perform	ed to confirm Im	peller & Motor rotation i	s correct.				

Revision 0

	٢		PRE-C	OMMISSIONIN	G FORM	Page 2 of 2
	Winnipeg		EQUIPME	ENT INSPECTIO	System Title:	
ject	Facility:	NEWP	c c	Project Name:	NEWPCC Boiler Replace	ement 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

Comments:			

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

2_Commissioning Forms



	C	COMMIS	SIONING FORM	Page 1 of 5			
V	Vinnipeg	MOTOR C	ONTROL CENTRE	ID:			
ject	Facility:	NEWPCC	Project Name: NEWPCC Boiler Replacer	nent 2025-2026			
Pro	Area :	В	Bid Opportunity: 277-2025				
# #	General Contr	ractor:	Project Manager:				
Projec contac	Consultant:		Contract Administrator:				
- 0	City of Winnip	eg:	Consulting Project Manager:				

	MCC Equipment No.	:			Location:				No. of Sec	No. of Sections:	
	Manufacturer:				Model:			Serial No:			
	Rated Voltage:	V	Vertical Bus:		А	Horizontal Bus:		A	Withstand	k	AIC
	Copper Bus	🗌 3 Wire	e 🗌 Bottom	Entry	/ [] Top Entry	Service	Entrance Ra	ited:	🗌 Yes	🗌 No
ta	Aluminum Bus	🗌 4 Wire	e Control Vol	Control Voltage:			Neutral Bus			🗌 Yes	🗌 No
inelboard Dat	☐ Main Breaker Settings: Frame: A L: Trip: A I:		S: G <u>:</u>		rip Plug:] LI] LSI] LSIG	Manufacturer:	Мос	del:			
å	🗌 Main Lugs	^F use A									
	☐ Alternative Circuit Feed Frame: A Trip: A	e Settings: S: T A I: G: []			rip Plug:] LI] LSI] LSIG	Manufacturer:	Моо	del:			
	Refer to following se	ctions for n	nain breaker if >	= 250	DA, or has	long, short, or grou	ind fault s	ettings.			

	Power Me	eter Installed:		🗌 Yes 🗌 No		lo	Manufacturer:	Model:
	Phases:	🗌 1ph 🛛 3ph	CT Ratio:			Me	etering Voltage	Power Supply Voltage
							Manufacturer:	Model:
sories	Transient Voltage Suppressor Installed:		🗌 Yes	🗌 Yes 🗌 No		Instrument No.:		
Acces	Phases:	🗌 1ph 🛛 3ph	Rating:	kА	kA N		COV:	
					1		Manufacturer:	Model:
	Power Fa	Power Failure Relay Installed:			🗌 Yes 🗌 No			
		-					Instrument No.:	
	Phases:	🗌 1ph 🛛 🗌 3ph				Vo	olts:	
	Comment	Comments:						

Winnipeg

COMMISSIONING FORM MOTOR CONTROL CENTRE

Page 2 of 5

ID:

	Identification Tag Installed:		☐ Yes	□ No	Visual Signs of Overheating:		☐ Yes	□ No
	Visual signs of Moisture:		🗌 Yes	🗌 No	Visual Signs of Corona:		🗌 Yes	🗌 No
E	Fuse/Breaker Sizes Match Dra	awings:	🗌 Yes	🗌 No	Cables Supported Appropriately:		🗌 Yes	🗌 No
aninç	Power Cables Labeled at Both	ו Ends:	🗌 Yes	🗌 No	Control Cables Labeled at Both	Ends:	🗌 Yes	🗌 No
r / Cle	All Pilot Device Lamacoids Ins	stalled	🗌 Yes	🗌 No	All Bucket Lamacoids Installed		🗌 Yes	🗌 No
ection	Power Cable Connections:	Good	Acceptable	Poor	Control Cable Connections:	Good	Acceptable	Poor
Inspe	All instruments work:	Good	Acceptable	Poor	Ground Connection:	Good	Acceptable	Poor
sual	Door Mechanical:	Good	Acceptable	Poor	Elec/Mech Interlocks:	Good	Acceptable	Poor
Vis	All buckets close securely:	Good 🗌	Acceptable	Poor	Required clearances met:	Good	Acceptable	Poor
	Cleanliness (As Found):	Good	Acceptable	Poor	Vents/Filter Conditions:	Good	Acceptable	Poor
	Exercise All Circuit Breakers a Disconnects:	and	☐ Yes	🗌 No	Comments:			

	Source: Test Disconnecte	ed Note	e: Approval of	City's Represe	ntative is	Equipment Temperature: °C
	Preparation: Connected Source Isc	with duri plated	ng the test.	aving cables c	Jinecleu	Temperature Correction Factor to 20°C:
Its	Test		Resista	nce Line to Lo	oad (uΩ)	Test Summary
emer	lest		Phase A	Phase B Phase C		Test Passed
easur	Main Breaker	□ N/A				Test Inconclusive Further Investigation Required.
ole M	Alternate Source Breaker	□ N/A				☐ Test Failed
act / Po	Downstream MCC Feeder Breaker	□ N/A				
Conta	Breaker	□ N/A				
Ū	Breaker	□ N/A				
	Breaker N/A					
	Comments:					

e Test	Test Preparation:	Source	: connected inected with Source	Ca Isolated	ble Destinat Disconnect Connected	tion/Load: ed with Source	e Isolated	Note: Approval of City's Representative is required, prior to leaving cables connected during the test.
istanc	Equipment Temperature:			°C	Temperature Correction Factor to 20°C:			
n Res	Test MCC Vertical Bus Phase to Ground		Voltogo	Insulation Resistance ($M\Omega$)			Ground all phases not under test	
latio			vollage	Phase A	Phase B	Phase C	Test Summary	
Insu							Test Passed	
	MCC Vertical Bus Phase to Phase							Test Inconclusive



COMMISSIONING FORM MOTOR CONTROL CENTRE

Page 3 of 5

ID:

Commenter			
MCC Horizontal Bus Phase to Phase			Test Failed
MCC Horizontal Bus Phase to Ground			Further Investigation Required.

Comments:

				Breake	rs Without Inst. S	Setting						
	List by model of breaker. Multiple breakers of varying ampacity may be listed per line.											
akers	Load Tag	Cell Location	Frame Size (A)	Trip Size (A)	Manufacturer	Model Series	Visual Inspection	Comments				
Bre												
sder												
I/Fee												
Load												
Visu	Visual Inspection: G=Good, A=Acceptable, P=Poor. Provide comments for breakers listed as poor. 1. Record all feeder bucket fuses and circuit breakers tying into MCC bus.											

Confirm lamacoid is installed.

2. 3. Look for visual indications of overheating

4.

Inspect and torque connections. Confirm disconnect operation and exercise operation including with circuit breaker. 5.

6. Confirm cables are routed and supported appropriately.

s	List by m	odel of breaker. Mu	ltiple break	ers of varying a	mpacity	may be li 	isted per line.				
akers	Main Breaker	Long Time Setting	s □N/A	Short Time Settings		□ N/A	Inst. Time Settings	□ N/A	Ground Settings		□ N/A
Bre	🗌 N/A	Pickup: Dela	y:	Pickup:	Delay:		Pickup:	Delay:	Pickup:	Delay:	
ncoming E	Alt. Source Breaker	Long Time Settings	□ N/A	Short Time Settings		□ N/A	Inst. Time Settings	□ N/A	Ground Settings		□ N/A
-	🗌 N/A	Pickup: Dela	y:	Pickup:	Delay:		Pickup:	Delay:	Pickup:	Delay:	

	List by model of brea	ker. Multiple breakers	s of varyi	ng ampac	ity may be listed per li	ine.		
rs	Feeder	Long Time Settings		🗌 N/A	Short Time Settings	🗌 N/A	Inst. Time Setting	gs 🗌 N/A
ake		Pickup:	Delay:		Pickup:	Delay:	Pickup:	Delay:
Bre	Feeder Long Time Settings			🗌 N/A	Short Time Settings	□ N/A	Inst. Time Setting	gs 🗌 N/A
edel		Pickup:	Delay:		Pickup:	Delay:	Pickup:	Delay:
d/Fe	Feeder	Long Time Settings	□ N/A		Short Time Settings	🗆 N/A	Inst. Time Setting	gs 🗌 N/A
Loa		Pickup:	Delay:		Pickup:	Delay:	Pickup:	Delay:
	Feeder	Long Time Settings		🗌 N/A	Short Time Setting	js □N/A	Inst. Time Sett	ings 🗌 N/A
		Pickup:	Delay:		Pickup:	Delay:	Pickup:	Delay:

Winnipeg

COMMISSIONING FORM MOTOR CONTROL CENTRE

Page 4 of 5

ID:

	Feeder	Long Time Set	tings 🗌 I	J/A	Short Time Settings			🗌 N/A	□ N/A Ins		t. Time Settings	
		Pickup:	Delay:		Pickup	:	Del	ay:	Picku	ıp:	Delay:	
Þ	Power Failure	Percent U	nbalance:			Delay T	ïme Se	etting		Line V	oltage S	etting
Rela	<u>∟</u> N/A	□ N/A	%	٦] N/A	Restart:	S	Trip:	s	Volts:	VAC	

									٦	TVSS			Power	Failure			
	Display I	Light Illu	ninat	es			TVSS S	Status					Pow	er Failure Status	🗌 Ye	s 🗌 No	□ N/A
	Signal Red	ceive at l	PLC (Card			□ N	/A	C] Yes	🗌 No	□ N/	A [□ N/A	🗌 Ye	s 🗌 No	□ N/A
	Signal A	Appears	on HN	/1					C] Yes	🗌 No	□ N/	A			s 🗌 No	□ N/A
	SCADA	Can See	e Sigr	al					C] Yes	🗌 No	□ N/	A			s 🗌 No	□ N/A
	Relay F	Fully Fun	ctiona	al					C	Yes	🗌 No	□ N/	A			s 🗌 No	□ N/A
	Fail-Sa	afe Moni	toring						C	Yes	🗌 No	□ N/	A			s 🗌 No	□ N/A
	Resets	Automa	tically	/				□ Yes □ No □ N/A				A		□ Ye	s 🗌 No	□ N/A	
	Test Meter:	Mar	ufact	urer:			Model: Calibration Date:										
	Comments							_		1							
Ð	Power Meter Fully Functional						🗌 No	🗆 N/	/A								
Testin	Phase				De	Desired Value (V)			played	Value Measured Value (V)			Difference	Difference (V)		ble?	
ation	A Power Meter Voltage Line to Ground C		А												🗌 Yes	🗌 No	
menta				В												🗌 Yes	🗌 No
nstru				С												🗌 Yes	🗌 No
				А											🗌 Yes	🗌 No	
2	Power Meter Cu Line to Ground	urrent	В												🗌 Yes	🗌 No	
				С												🗌 Yes	🗌 No
	Desired TVSS F	Relay Lin	e Vo	tage				Test N	leter	r Meas	ured Pha	se Line	Voltage	State	St	ate Descrip	otion
	А-В	B-C			C-A			A-B (V	')		B-C (V)		C-A (V)	(0 or 1)	(N	ormal or A	larm)
	600V	600V			600	V											
	Test Surge	600V			600	V											
	600V	Test S	urge		600	V											
	600V	600V			Test	t Su	ırge										
	Desired Power	Fail Rela	y Lin	e Vol	tage	9		Test N	leter	r Meas	ured Pha	se Line	Voltage	State	St	State Description	
	A-B	B-C			C-A			A-B (V	')		B-C (V)		C-A (V)	(0 or 1)	(N	ormal or A	larm)
	600V	600V			600	V											



COMMISSIONING FORM MOTOR CONTROL CENTRE

Page 5 of 5

ID:

0V	600V	600V			
600V	0V	600V			
600V	600V	0V			

is	Returned to Service:	🗌 Yes	🗌 No	Comments:
Final	Monitoring / Inspection Required:	🗌 Yes	🗌 No	
Ā	Repair / Replacement Required:	🗌 Yes	🗌 No	

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

	e		СО	MMIS	SIONI		Λ				Page 1 of 4	
	Winnipèg		VARIA	BLE F	REQU	JENCY DI	RIVE				ID:	
ject	Facility:	NEWPPC			Project	Name:	NEWPCC	C Boile	r Repl	acen	nent 2025-2026	
Pro	Area :	В			Bid Op	portunity:	277-2025					
					<u> </u>							
ect	General Conti	ractor:										
Proje	Consultant:				Contract Administrator:							
	City of Winnip	eg:			Consulting Project Manager:							
					R	esistance (uΩ)		Test	Sun	nmary	
lents		Test		Pha	se A	Phase B	B Phase C Tes			est F	Passed	
surem	Harmonic F	Filter Contact	□ N/A							est lı Regu	nconclusive Further Investigation	
Meas	Bypass Con	tactor Contact	🗌 N/A							est F	ailed	
Pole	Breaker/	Disconnect	□ N/A						1			
Contact	Comments:					·						
	Setup: Test Preparation: Source isolated Contactor open					ble Destinat Disconnect Connected	ion/Load: ed with Load	Isolate	ed	Note Rep leav test	e: Approval of City's presentative is required, prior to ring cables connected during the	
	WARNING: DIS	SCONNECT ALL F S PRIOR TO TES	BLES FI	ROM VF	D MODULE	AND CAF	PACITO	ORS.	DISC	CONNECT ALL CONTROL		
		Test				Insulation Resistance (MΩ)			IΩ)	Ground all phases not under test		
		Test		V	oltage	Phase A	Phase B	Pha	ise C	Tes	t Summary	
st	VF	FD Line to Ground		100	0 VDC						Fest Passed	
se Te:	VF	D Load to Ground	1	100	0 VDC						Fest Inconclusive Further Investigation Required.	
stanc	١	/FD Line to Load		100	0 VDC						Fest Failed	
Resi	Harmonic Fil	ter Contactor Line	to Ground	100	0 VDC							
ation	Harmonic Filt	ter Contactor Load	I to Ground	100	0 VDC							
Insul	Harmor	nic Filter Line to G	round	100	0 VDC							
	Bypass (Contactor Line to C	Ground	100	0 VDC							
	Bypass C	Contactor Load to	Ground	100	0 VDC							
	Bypass	Contactor Line to	Load	100	0 VDC							
	Comments:											

Winnipeg

COMMISSIONING FORM VARIABLE FREQUENCY DRIVE

Page 2 of 3

ID:

	Ramp	Specified	Actu	ıal	Cu	rrent		Spec	ified		Actual		
	Ramp Up Tin	ne:			Ra	mp Down	Time:						
	Motor Measu	red Current Phase A:			Phase B:					Phase C:			
	VFD Displaye	ed Current Phase A:			Phase B: Phase C:								
	Ammeter Cu	rrent in Bypass Mode [] N/#	A 🗌 Yes 🛛	Yes No PLC HMI Displayed Motor Current:								
ing	Potentiomete	er Adjust Speed in Manual	Mod	e 🗌 Yes [☐ Yes ☐ No Potentiometer Adjust Speed in Local Auto Mode						Node 🗌 Yes 🗌 No		
Test	Description			Forward Run,	Start,	Stop			Reverse Run,	Star	t, Stop		
ional	VFD Manual	□ N/A	Yes No				🗆 N/A	ר <u>ב</u>	/es	🗌 No			
perat	VFD Automa												
oad Op	VFD Automa												
ull Lo	Bypass Manu												
Ē	Bypass Autor												
	Comments												
	Program VFD	Settings to Match Setting	Lette	er	VFI	D Setting	Letter Fil	e Nan	ne:				
	Settings Appli	ed to VFD Yes		🗌 No									

	r logiain vi b	octango to mato			
	Settings Appli	ed to VFD	🗌 Yes	🗌 No	
VFD Settings	Comments				



ID:

	Verify Control Signa	lls Between VFD a	nd PLC	;	Comme	nts:		
	Test Preparation: Te not permitted.	est physical signal	s. Jump	ers for signals				
	Field wiring labelled	at both ends?] Yes	🗌 No				
	Settings Applied to	VFD [] Yes	🗌 No				
	Discrete Signals	Pilot Light Illumi	nated	Signal Rec	eived at F	LC Card	Signal Appears on HMI	SCADA Can See Signal
	Ready	□ N/A □ Yes	🗆 N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
	VFD Mode	□ N/A □ Yes	□ N	lo 🗆 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
	Bypass Mode	□ N/A □ Yes	🗆 N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
ings	Manual Mode	□ N/A □ Yes	🗆 N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
) Sett	Auto Mode	□ N/A □ Yes	□ N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
VFI	Forward Run	□ N/A □ Yes	🗆 N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
	Reverse Run	□ N/A □ Yes	🗆 N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
	VFD Fault	□ N/A □ Yes	🗆 N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
	Bypass Fault	□ N/A □ Yes	🗆 N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	🗌 N/A 🗌 Yes 🗌 No
	Vibration Lockout	□ N/A □ Yes	🗆 N	lo 🗌 N/A	🗌 Yes	🗌 No	□ N/A □ Yes □ No	🗌 N/A 🗌 Yes 🗌 No
	Analog Signals	Measured Signa	ı د	Signal Receive	ed at VFD/	PLC Card	Signal Appears on HMI	SCADA Can See Signal
	Speed Input		mA [□ N/A □	Yes	🗌 No	□ N/A □ Yes □ No	□ N/A □ Yes □ No
	Speed Reference		mA [□ N/A □	Yes	🗌 No	□ N/A □ Yes □ No	🗌 N/A 🗌 Yes 🗌 No
	Motor Current		mA [□ N/A □	Yes	🗌 No	□ N/A □ Yes □ No	🗌 N/A 🗌 Yes 🗌 No
is	Returned to Service	:		Yes 🗌 No	Comme	nts:		
Final	Monitoring / Inspect	ion Required:		Yes 🗌 No				
Ar	Repair / Replacement Required:			Yes 🗌 No				

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.



ELECTRICAL COMMISSINING CHECKLIST



	PROJECT
Facility: NEWPCC	Project Name: NEWPCC Boiler Replacement 2025-2026
Area: B	Bid Opportunity: 277-2025

Verification of Instrument Range										
	Signal [Unit]		Test	ted By	Signature	Date				
4 mA	12 mA	20 mA	Company	Name		(YYYY-MM-DD)				
	4 mA	Signal [Unit] 4 mA 12 mA	Verificat Signal [Unit] 4 mA 12 mA 20 mA	Verification of Instrume Signal [Unit] Test 4 mA 12 mA 20 mA Company 4 12 mA 10 mA 10 mA 10 mA	Verification of Instrument Range Signal [Unit] Tested By 4 mA 12 mA 20 mA Company Name Image: Ima	Verification of Instrument Range Signal [Unit] Tested By Signature 4 mA 12 mA 20 mA Company Name Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Signature 4 mA 12 mA 20 mA Company Name Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) 4 mA 12 mA 20 mA Company Name Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) 4 mA 12 mA 20 mA Company Name Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit) Image: Signal (Unit)				

Verification of Instrument Signal									
Instrument Tag Signal [Unit]			Teste	Tested By		Date			
	0%	25%	50%	75%	100%	Company	Name		(YYYY-MM-DD)

Winnipeg		CON	MISSIONING F	Page 1 of 2		
		SYSTE	M FUNCTIONA	System Title:		
ject	Facility:	NEWPO	C C	Project Name:	NEWPCC Boiler Replace	ment 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

Commissioning 1. Commission boiler, natural gas train and digester gas train. Process Overview 2. Commissioning functional test form to be finalized based on shop drawings received from boild	nal Ig	System Title:	
vendor.	Functio Testin	Commissioning1Process Overview2	 Commission boiler, natural gas train and digester gas train. Commissioning functional test form to be finalized based on shop drawings received from boiler vendor.

	Functional Testing	– Boiler – Normal Operation							
	Equipment Tag (s):	Boiler: BLR-B0005							
	Action	 Confirm boiler can be started from local control panel once dedicated pump re (29 L/s), ie. PCS sends enable signal to boiler control panel 	aches high	flow rate					
		 Confirm boiler starts-up through vendor control process including, pre-purge, 	firing, etc.						
		 Confirm boiler can be controlled using boiler manual mode through PCS 							
		 Confirm boiler can be controlled using boiler auto mode through PCS 							
		Confirm boiler can be controlled using plant master through PCS							
		Confirm boiler local E-stop shuts down boiler							
		Confirm low water cut-off shuts down boller							
		Confirm now now switch cut-off shuts down boller Confirm natural gas high pressure and low pressure shutdown	Confirm natural gas high pressure and low pressure shutdown						
		Confirm diagester das high pressure and low pressure shutdown							
		 Perform tests for both natural gas and digester gas fuels. 							
	Expected Result	Boiler starts-up via local control panel after receiving enable signal from PCS	(dedicated r	oump					
		reaches correct flow rate)		•					
		Boiler is controlled through manual, auto and cascade modes through PCS H	MI						
		Boiler burner shuts down and alarms on HMI	ler burner shuts down and alarms on HMI serve and verify that boiler burner shut OFF and an alarm is generated.						
	Field Checks	• Observe and verify that boiler burner shut OFF and an alarm is generated.							
		 Verify that the boiler is operating to correct control output and set point temp Verify helds is controlled through along PCC 							
		 Verify boiler is controlled through plant PCS – manual, auto and cascade mod Manual: test boiler runs at 25% 50% 75% and 100% control output 	les						
		 Auto: test boiler runs at 104 C 108 C 112 C and 116 C 	L						
Ð		 Cascade: boiler is controlled by Plant Master. Observe temperature 	and control	output					
stin		adjustment based on Plant Master	·						
al Tes		 Verify that the status of the boiler is shown correctly on the HMI screen. 							
		 Verify digester gas and natural gas high pressure and low pressure shutdown 	utdowns						
ion	Actual Decult	Boiler may be disabled through PCS HMI							
nct	Actual Result	Boller run status appears on HMI Beiler receives enable signal from DCS and "Beiler Enabled" indication is							
Fu		• Boller receives enable signal from PCS and Boller Enabled indication is							
		Boiler is started via local control panel and successfully starts through	🗌 Yes	🗌 No					
		vendor start-up sequence. Boiler is turned on only after enable signal is							
		received.							
		 Boiler shutdown on local e-stop activation 							
		Boiler is disabled through PCS HMI							
		Dedicated pump ramps down to low now rate Boilor is disabled on local control papel							
		Dedicated pump ramps down to low flow rate	🗌 Yes	🗌 No					
		Boiler manual mode achieves:							
		o 25%							
		o 50%							
		0 75%	T Yes						
		 100% Boilor auto modo achiovos: 							
		• Boller auto mode achieves. \circ 104 C	🗌 Yes	🗌 No					
		o 108 C	☐ Yes						
		o 112 C							
		o 116 C							
		In cascade mode, boiler control output and temperature output are madulated uit DCC and Plant Machine							
		modulated via PCS and Plant Master	🗌 Yes	🗌 No					
		Boiler shutdown for natural gas high pressure Boiler shutdown for natural gas low pressure	☐ Yes	□ No					
		Boiler shutdown for diaester gas high pressure							
		Boiler shutdown for digester gas low pressure							

	Winnipeg COM SYSTE			MMISSIONING	FORM AL TEST	Page System Title:	2 of 2	
ject	Facility:	NEWPO	cc	Project Name:	NEWPCC Boiler Replace	ement 2025-2	026	
Pro	Area:	В		Bid Opportunity:	277-2025			
			 Boiler shutdow Boiler shutdow PCS receives a encounters a fa acknowledge ti A low flow alarn detects low flow If the flow switc initiates shutdo Boiler fuel char Boiler fuel char 	n on low flow switch n on low water cuto and HMI displays a ault. When the fault he alarm on the HM m is generated on th w. ch on the outlet of th wan and is disabled. nge over from natura-	a activation ff switch general fault alarm when the is fixed, an operator is able I and clear the fault. ne HMI if the boiler's dedicat the boiler detects low flow, the An alarm is generated on the al gas to digester gas.	e boiler to red flowmeter e boiler ne HMI.	 ☐ Yes 	No No No No No No No

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Comments:

Winnipeg			CON	MISSIONING I	FORM	Page 1 of 2
			SYSTE	M FUNCTIONA	System Title:	
ject	Facility:	NEWPO	c	Project Name:	NEWPCC Boiler Replace	ement 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

g	System Title:			
Testin	Commissioning Process Overview	1.	Commission boiler, natural gas train and digester gas train.	

Г

Functional Testing – Boiler – Normal Operation								
	Equipment Tag (s):	Boiler: BLR-B0006						
	Action	 Confirm boiler can be started from local control panel once dedicated pump re (29.1 (c) is PCS sends enable signal to boiler control panel 	aches high	flow rate				
		 Confirm boiler starts-up through vendor control process including, pre-purge, 1 	firing, etc.					
		Confirm boiler can be controlled using boiler manual mode through PCS	0.					
		Confirm boiler can be controlled using boiler auto mode through PCS						
		Contirm boiler can be controlled using plant master through PCS Confirm boiler level E stop abute down boiler						
		Confirm low water cut-off shuts down boiler						
		Confirm low water cut on shirts down boiler Confirm low flow switch cut-off shuts down boiler						
		Confirm natural gas high pressure and low pressure shutdown						
		 Perform tests for both natural gas and digester gas fuels. 						
	Expected Result	Boiler starts-up via local control panel after receiving enable signal from PCS	(dedicated p	oump				
		reaches correct flow rate)	N/I					
	Boiler burner shuts down and alarms on HMI							
	Field Checks							
		Verify that the boiler is operating to correct control output and set point temper						
		 Verify boiler is controlled through plant PCS – manual, auto and cascade mod 	les					
		 Manual: test boiler runs at 25%, 50%, 75% and 100% control output 	t					
		 Auto: test boller runs at 104 C, 108 C, 112 C, and 116 C Cascade: boller is controlled by Plant Master. Observe temperature 	and control	outout				
ing		adjustment based on Plant Master		output				
esti		• Verify that the status of the boiler is shown correctly on the HMI screen.						
I Te		 Verify digester gas and natural gas high pressure and low pressure shutdown 	S					
ona		Boiler may be disabled through PCS HMI						
ctic	Actual Result	Boiler run status appears on HMI Boiler receives apple signal from BCS and "Poiler Enchlad" indication is						
ņ		Bollet receives enable signal from PCS and Bollet Enabled indication is shown on the HMI						
ш		Boiler is started via local control panel and successfully starts through	🗌 Yes	🗌 No				
		vendor start-up sequence. Boiler is turned on only after enable signal is						
		received.						
		Boiler shutdown on local e-stop activation Boiler is disabled through BCS HMI	☐ Yes					
		Dedicated pump ramps down to low flow rate	☐ Yes	□ No				
		Boiler is disabled on local control panel	☐ Yes	No No				
		 Dedicated pump ramps down to low flow rate 	∐ Yes	L No				
		Boiler manual mode achieves:	□ Yes					
		o 25%	☐ Yes					
		0 75%	🗌 Yes	🗌 No				
		o 100%	∐ Yes	∐ No				
		Boiler auto mode achieves:						
		o 104 C	☐ Yes					
			🗌 Yes	🗌 No				
		o 116 C						
		In cascade mode, boiler control output and temperature output are						
		modulated via PCS and Plant Master	☐ Yes	□ No				
		Boiler shutdown for natural gas high pressure	☐ Yes	No				
		Boiler shutdown for natural gas low pressure Boiler shutdown for digester gas high pressure	☐ Yes					
		Boiler shutdown for digester gas low pressure						
		Boiler shutdown on low flow switch activation						
I	1							

Winnipeg CON SYSTE			CON SYSTE	IMISSIONING FORM IM FUNCTIONAL TEST System			2 of 2		
Facility: NEWPCC				Project Name:	NEWPCC Boiler Poplac	Title:	126		
rojec					Project Name: NEWPCC Boiler Replacement 2025-2026				
4	Area:	В	Bid Opportunity: 277-2025						
			 Boiler shutdown on low water cutoff switch PCS receives and HMI displays a general fault alarm when the boiler encounters a fault. When the fault is fixed, an operator is able to 			e boiler to	☐ Yes ☐ Yes	No No	
			 acknowledge the alarm on the HMI and clear the fault. A low flow alarm is generated on the HMI if the boiler's dedicated flowmeter 				🗌 Yes	□ No	
		 If the flow switch on the outlet of the boiler detects low flow, the boiler 				🗌 Yes	🗌 No		
	 initiates shutdown and is disabled. An alarm is generated on the HMI Boiler fuel change over from natural gas to digester gas. Boiler fuel change over from digester gas to natural gas. 				☐ Yes ☐ Yes	□ No □ No			

Comments:

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Winnipeg			CON	COMMISSIONING FORM		
			SYSTE	M FUNCTIONA	System Title:	
ject	Facility:	NEWPO	c	Project Name:	NEWPCC Boiler Replace	ment 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

nal Ig	System Title:		
Functio Testin	Commissioning Process Overview	1.	This functional test will verify the circulation pump with domestic water transferred from the hot water mixing tank to boiler BLR-B0005.
	Eunctional Testing –	Boiler	– Normal Operation

Functional Testing – Boiler – Normal Operation								
Equipment Tag(s):	Pump: P-B0110							
Action	 Operate and ensure the manual valve is in the "Open" position to allow domestic water flow from the hot water mixing tank to the pump. Enable boiler circulation pump on HMI and manually to start. Adjust flow rate through HMI for a minimum 6 points for a minimum duration of 5 minutes each. Flow rate to be at 0%, 20%, 40%, 60%, 80% and 100% the maximum recommended flow rate as directed by the Contract Administration. Record associated flow rate set point, pump speeds, measured flow rate through flow meters, pressure gauge readings and pump motor amperage. 							
Expected Result	 Pressure gauge on pump discharge measures discharge pressure. Associated circulation pump flow meter register flow rate. 	Pressure gauge on pump discharge measures discharge pressure. Associated circulation pump flow meter register flow rate.						
Field Checks	 Verify no leaks in piping system. Record associated flow rate set point, pump speeds, measured flow rate thropressure gauges. Record set points for high speed flow rate and low speed flow rate. 	 Verify no leaks in piping system. Record associated flow rate set point, pump speeds, measured flow rate through flow meters a pressure gauges. Record set points for high speed flow rate and low speed flow rate. 						
Actual Result	Piping leaks observed.	🗌 Yes	🗌 No					
	Pump starts via local hand switch.	🗌 Yes	🗌 No					
	Pump starts when called for by PCS.	🗌 Yes	🗌 No					
	Pump flow received by PCS and displayed on HMI.	🗌 Yes	🗌 No					
	• Pump ramps down to low flow rate when its dedicated boiler is disabled.	🗌 Yes	🗌 No					
	• Pump ramps up to high flow rate when its dedicated boiler is enabled.	Pump ramps up to high flow rate when its dedicated boiler is enabled. Yes No						
	• If a pump is off and its dedicated boiler is enabled, the pump shall ramp to	Yes	🗌 No					
	the high flow rate.							
	Pump is turned off via HMI.	☐ Yes	□ No					
	Pump is turned off via local control panel.	☐ Yes	□ No					
	Pump run status displayed on HMI.	∐ Yes	∐ No					
	High flow rate set point:							
	Low flow rate set point:							
	Pressure gauge, flow meter and pump motor amperage reading for each scenario.							
Ē	% Speed (rpm) Pressure (kPa) Flow Rate (L/sec) Pump Motor (A)	_						
		_						
	40	-						
	60	-						
	80							
	100							

Winnipeg COM SYSTE		MISSIONING FORM M FUNCTIONAL TEST		Page 2 of 2 System Title:		
ject	Facility:	NEWPC	c	Project Name:	NEWPCC Boiler Replace	ement 2025-2026
Proj	Area:	В		Bid Opportunity:	277-2025	

Comments:	

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

			COMMISSIONING FORM SYSTEM FUNCTIONAL TEST			Page 1 of 2
Winnipeg		System Title:				
ject	Facility:	NEWPO	c	Project Name:	NEWPCC Boiler Replace	ment 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

nal Ig	System Title:		
Functio Testin	Commissioning Process Overview	1.	This functional test will verify the circulation pump with domestic water transferred from the hot water mixing tank to boiler BLR-B0006.

щ.									
	Functional Testing	– Boiler	– Normal Ope	ration					
	Equipment Tag (s):	Pump: F	P-B0120						
	Action	 Operate and ensure the manual valve is in the "Open" position to allow domestic water flow from the hot water mixing tank to the pump. Enable boiler circulation pump on HMI and manually to start. Adjust flow rate through HMI for a minimum 6 points for a minimum duration of 5 minutes each. Flow rate to be at 0%, 20%, 40%, 60%, 80% and 100% the maximum recommended flow rate as directed by the Contract Administration. Record associated flow rate set point, pump speeds, measured flow rate through flow meters, pressure gauges and pump motor amperage readings. 							
	Expected Result	•	Pressure gauge	e on pump discharge	e measures discharge	pressure.			
	Field Checks	 Associated circulation pump flow meter register flow rate. Verify no leaks in piping system. Record associated flow rate set point, pump speeds, measured flow rate through flow meters and pressure gauges. 							
	Actual Result	•	Piping leaks ob	oserved.	·		☐ Yes	□ No	
D		•	Pump starts via local hand switch.					🗌 No	
stin		Pump starts when called for by PCS.						□ No	
II Te		Pump flow received by PCS and displayed on HMI.						□ No	
iona		•	Pump ramps down to low flow rate when its dedicated boiler is disabled.						
Inct		•	• Pump ramps up to high flow rate when its dedicated boiler is enabled.						
Ъ		•	If a pump is off the high flow ra	and its dedicated bo	piler is enabled, the pu	L Yes			
		•	Pump is turned	l off via HMI.			🗌 Yes	🗌 No	
		•	Pump is turned off via local control panel						
		•	Pump run statu	us displayed on HMI.	•		🗌 Yes	🗌 No	
		•	High flow rate s	set point:	_				
		•	Low flow rate s	et point:					
		•	 Pressure gauge, flow meter and pump motor amperage reading for escenario. 						
		%	Speed (rpm)	Pressure (kPa)	Flow Rate (L/sec)	Pump Motor (A)			
		0							
		20					-		
		60					-		
		80					1		
		100					1		

Winnipeg		CON	MISSIONING F	ORM	Page	2 of 2	
		SYSTEM FUNCTIONAL TEST		System Title:			
ject	Facility: NEWPC		C	Project Name:	NEWPCC Boiler Replace	ement 2025	-2026
Pro	Area:	В		Bid Opportunity:	277-2025		

Comments:	

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Winnipeg		COMMISSIONING FORM SYSTEM FUNCTIONAL TEST			Page 1 of 2	
					System Title:	
ject	Facility:	NEWPO	C C	Project Name:	NEWPCC Boiler Replace	ement 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

nal g	System Title:		
Functio Testin	Commissioning Process Overview	1.	This functional test will verify the standby circulation pump with domestic water transferred from the hot water mixing tank to boiler BLR-B0005 or BLR-B0006.
	Functional Testing -	Boiler	- Normal Operation

	Functional Testing	nctional Testing – Boiler – Normal Operation							
	Equipment Tag (s):	Pump:	P-B0130						
	Action	•	Operate and en the hot water m	sure the manual va ixing tank to the pu	lve is in the "Open" po mp.	sition to allow domes	stic water flo	w from	
		•	Enable boiler circulation pump on HMI and manually to start.						
		•	Adjust flow rate	through HMI for a r	minimum 6 points for a	minimum duration c	of 5 minutes	each.	
			 Flow 	rate to be at 0%, 20)%, 40%, 60%, 80% ar	nd 100% the maximu	im recomme	ended	
				rd associated flow r	ate set point, pump sp	eeds, measured flov	v rate throug	h flow	
			meter	rs, pressure gauge	and pump motor ampe	rage readings.		,	
	Expected Result	•	Pressure gauge	e on pump discharge	e measures discharge	pressure.			
		•	Associated circ	ulation pump flow m	neter register flow rate.				
	Field Checks	•	Verify no leaks	in piping system.					
		•	pressure gauge	ted flow rate set po	int, pump speeds, mea	isured flow rate throu	ugn flow me	ters and	
		•	Record set poin	nts for high speed flo	ow rate and low speed	flow rate.			
	Actual Result	•	Piping leaks ob	served.			Yes	🗌 No	
5		•	Pump starts via local hand switch.					🗌 No	
stin		•	🗌 Yes	🗌 No					
Te		•	Pump flow received by PCS and displayed on HMI.						
onal		•	Pump ramps do	own to low flow rate	when its dedicated bo	iler is disabled.	🗌 Yes	🗌 No	
nctio		•	Pump ramps up to high flow rate when its dedicated boiler is enabled.						
Fur		•	If a pump is off	and its dedicated be	piler is enabled, the pu	mp shall ramp to	🗌 Yes	🗌 No	
			the high flow rat						
		•	Pump is turned	off via HMI.			Yes	🗌 No	
			Pump is turned	off via local control	panel.		🗌 Yes	🗌 No	
		•	Pump run status displayed on HMI						
		•	High flow rate s	et point:					
		•	Low flow rate se	et point:	-				
			Pressure dauge	e flow meter and pu	Imp motor amperage r	eading for each			
scenario.									
		0/	Speed (mm)		Flow Data (L/aga)	Dump Mater (A)			
		% 0	Speed (IpIII)	Plessule (kPa)	Flow Rate (L/Sec)				
		20							
		40]		
		60					1		
		80					4		
		100							

Winnipeg COM SYSTE		MISSIONING FORM M FUNCTIONAL TEST		Page System Title:	2 of 2		
ject	경 Facility: NEWPCC		C	Project Name:	NEWPCC Boiler Replace	ement 2025-2	2026
Pro	Area:	В		Bid Opportunity:	277-2025		

Comments:			

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Winnipeg		CON	MISSIONING F	FORM	Page 1 of 1	
		SYSTEM FUNCTIONAL TEST		System Title:		
ject	Facility:	NEWPO	C C	Project Name:	NEWPCC Boiler Replace	ement 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

nal Ig	System Title:		
Functio Testir	Commissioning Process Overview	1.	This functional test will verify the circulation pump with domestic water transferred from the hot water mixing tank to boiler BLR-B0007.

	Equipment Tag (s):	Pump: P-B0140		
	Action	 Operate and ensure the manual valve is in the "Open" position to allow do the hot water mixing tank to the pump. Enable boiler circulation pump on HMI to start. Record associated flow rate set point, pump speeds, measured meters, pressure gauge and pump motor amperage readings. 	mestic water fl	ow from gh flow
	Expected Result	Pressure gauge on pump discharge measures discharge pressure.		
Testing	Field Checks	 Verify no leaks in piping system Record associated flow rate set point, pump speed, measured flow rate th pressure gauges. 	rough flow met	ters and
Functional	Actual Result	 Piping leaks observed. Flow rate reading: Pump speed reading: Pressure gauge reading on pump discharge: Pump motor amperage reading: 	☐ Yes	No
	Comments:			

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Winnipeg		CON	MISSIONING F	ORM	Page 1 of 1	
		SYSTEM FUNCTIONAL TEST		System Title:		
ject	Facility:	NEWPO	C .	Project Name:	NEWPCC Boiler Replace	ment 2025-2026
Pro	Area:	В		Bid Opportunity:	277-2025	

nal Ig	System Title:		
Functio Testin	Commissioning Process Overview	1.	This functional test will verify the recirculation pump with domestic water transferred from the hot water mixing tank to boiler BLR-B0007.

	Equipment Tag (s):	Pump: P-B0150					
	Action	 Operate and ensure the manual valve is in the "Open" position to allow domestic water flow from the hot water mixing tank to the pump skid. Enable boiler circulation pump on HMI to start. Adjust flow rate to 2 L/s through HMI for a minimum duration of 5 minutes. Record associated flow rate set point, pump speeds, measured flow rate through flow meters, pressure gauge and pump motor amperage readings. 					
	Expected Result	 Pressure gauge on pump discharge measures discharge pressure. Associated circulation pump flow meter register flow rate. 					
al Testing	Field Checks	 Verify no leaks in piping system Record associated flow rate set point, pump speeds, measured flow rate through flow meters and pressure gauges. 					
Function	Actual Result	 Piping leaks observed. Flow rate reading: Pump speed reading: Pressure gauge reading on pump discharge: Pump motor amperage reading: 					
	Comments:						

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

	Image: WinnipegCOMWinnipegFI				IMIS	SIONING F ONTROL PA	ORM ANELS ST	Page 1 of 1 ID:
ject	Facility:	NEWPC	C		Proje	ct Name:	NEWPCC Boiler Replac	ement 2025-2026
Pro	Area: B			Bid C	Opportunity:	277-2025		
	Equipment Tag: Diagram/Drawi Equipment Turac: Local Control Panels				ing:		Location:	
Local Control Panel Commissioning Checklist	Checklist:	Checklist: Panel tag/lam			ete.	 Fuses installed and properly sized as per drawings/Field Instructions/RFIs. Panel door emergency stops tested (if applicable). Panel door selector switches operational (if applicable). VFD speed potentiometer operational (if applicable). 		 Panel door pilot lights pperational (if applicable). Panel mounted local displays pperational (if applicable). System functional test forms complete.
	Comments:							
s	Returned to Se	rvice:		Yes No] N/A Comm	nents:	

Final Analysis	Returned to Service:	🗌 Yes	🗌 No	□ N/A	Comments:
	Monitoring / Inspection Required:		🗌 Yes	🗌 No	
	Repair / Replacement Required:		🗌 Yes	🗌 No	

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

Winnipeg			CON	COMMISSIONING FORM			
			FUNCTIONAL TEST			System Title:	NETWORKING
ject	Facility:	NEWPO	C	Project Name:	NEWPCC Boiler Replace	ement 2025	-2026
Pro	Area: B			Bid Opportunity:	277-2025		

Network Inspection and Checklist	Drawings:		Location:				
	Equipment Type:	Networking					
	Checklist:	 Network cables installed, tested, and terminated. Network cables copper and fiber test results recorded. Networking equipment powered and operational. Networking equipment is properly tagged. 	 Patch cables Networking e cables installed drawings/RFIs/I Device netw communicating. Control netw communicating. 	s installed. equipment and as per Field Instructions ork devices	 Fire alarm system communicating. Card access system communicating. CCTV system communicating. 		
	Comments:						
	Returned to Serv	vice: 🗌 Yes 🗌 No 🗌] N/A Commen	ts:			

Final Analysis	Returned to Service:	🗌 Yes	🗌 No	🗌 N/A	Comments:
	Monitoring / Inspection Required:		🗌 Yes	🗌 No	
	Repair / Replacement Required:		🗌 Yes	🗌 No	

	Company	Name	Signature	Date (yyyy/mm/dd)
Performed By				
Checked By				

Note: The person performing the check is responsible for ensuring that the data is transcribed from the handwritten form correctly, and that the analysis results are correct.

APPENDIX C

Commissioning Deficiency Log

ltem Number	Start Date (YYYY-MM-DD)	Discipline (Select from Dropdown)	Description of Commisioning Activity	Deficiencies	Building/Area	Comment	Action Taken	Current Status	Reference Document	Target Completion Date (YYYY-MM-DD)	Completion Date (YYYY-MM-DD)	SUBSTANTIAL / TOTAL PERFORMANCE / FINAL OCCUPANCY / WARRANTY / POST TOTAL PERFORMANCE	Priority (HIGH, MED, LOW)
													l
													1 1
													/
													↓
								l – – – – – – – – – – – – – – – – – – –					╉─────┦
								<u>} </u>					<u>↓</u>
								<u> </u>					+
			1										1 1



Experience in Action