Harrington AAFC Dust Collector
Commissioning Plan

Draft – Rev. A

CBCL

202621.00 • November 2020

A	Draft Report	P.Arsenault		M.Peachman
Issue or Revision		**Reviewed By:**	**Date**	**Issued By:**

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20 November 2020

Darcy Grant, P.Eng.
Mechanical Engineer
Architecture and Engineering Resources
Public Services and Procurement Canada
Sherwood Business Ctr, 161 St. Peters Rd, Ste 204
Charlottetown, P.E.I, C1A 5P7

Dear Mr. Grant:

RE: Project No. 202621.00 – Harrington AAFC Dust Collection – Commissioning Plan Draft Report

CBCL is pleased to provide the Draft Commissioning Plan report for your review and comments.

Yours very truly,

CBCL Limited

Prepared by:
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Project No: 202621.00

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Chapter 1 Introduction

Commissioning is a quality assurance process, conducted by an individual independent of the design and construction teams, to improve the success of a construction project. It provides the owner with a means to independently verify the project's planning, design, construction and operational process. The commissioning process seeks to provide optimized energy efficiency and indoor air quality.

The commissioning process during both the design and construction phases consists of the following steps:

- Review of design documents;
- Ensure the design is well documented and that it meets the owner's intent;
- Ensure the bid documents show the proper requirements for commissioning;
- Review installation of applicable equipment and systems;
- Review operations checkout performed by installing contractors;
- Verify and document proper performance of equipment;
- Review operation and maintenance manuals and ensure a copy remains on site; and,
- Review training of owner's operating and maintenance staff.

1.1 Definitions

In order to understand the Commissioning Plan, the following terms have been defined. Any reference to these terms carriers the stated and associated working definition outlined herein.

Basis of Design: The Basis of Design (BOD) document is used by the design team to explain its reasoning and assumptions for choices made in the DN.

Commissioning Authority (CxA): Is the service firm and its resources (internal and external) that provide the planning, preparation, implementation and management of the detailed commissioning plan. The CxA will be responsible for coordinating the activities of the commissioning team members.

Commissioning Check Sheets: Mechanical, Electrical and Controls equipment check sheets that are specific to each system and its major components. These are used to verify

system operation and are developed by the CxA with the support of the project team and OEM suppliers.

Commissioning Plan: The Commissioning Plan defines the scope and approach to the Total Building Commissioning program that is to be executed for the project.

Commissioning Team: Personnel that will be directly involved in the building commissioning process. The commissioning team consists of the CxA, Contractors & Consultants.

Consultants: The architects and engineers responsible for producing the design drawings and specifications for this project as well as the base contract administration inspection, quality assurance and acceptance activities.

Contractor Startup Program: Contractor startup and verification program activities are conducted by the contractors and/or their sub-trades and equipment vendors. Contractor/vendor checking of the physical installation of the work and equipment and reviewing the completion of the system installation and readiness is completed prior to the CxA functional performance testing and verification activities.

Contractors Site Cx Coordinator: Personnel that represent the mechanical, electrical and controls contractors and coordinate the commissioning process with the CxA

Contractors: These are the general, mechanical. Electrical, controls, fire protection construction firms and their subcontractors who are responsible for the physical construction of the project.

Design Narrative: The design Narrative (DN) is where the design team describes in detail the concepts and features it intends to incorporate during schematics.

Functional Performance Testing: Functional performance tests are specific hands-on tests, used to verify that the equipment and associated systems meet the specified design parameters and operate as fully integrated components or systems through their respective level of automation. This testing also confirms the capabilities of each system to meet the requirements of the facility and the Owner's Project Requirements. To test all systems under peak operating conditions, some functional performance testing may be deferred at the discretion of the CxA (e.g. seasonal testing examines the heating system performance under appropriate cold weather conditions).

In Contract Tests: Testing requirements that are defined in the contract documents that are a contractor's responsibility to carry out and document appropriately.

Owner's Project Requirements: Meeting the Owner's Project Requirements (OPR) is the primary concern of the commissioning team. This important document will guide the

design, construction and operation of the future building. This can include project goals, measureable performance criteria, cost considerations, benchmarks, success criteria and supporting information.

Project Manager: The individual or firm responsible for the overall management and delivery of the project to the Owner.

Status Inspections: Systematic detailed inspections of mechanical, electrical systems and components carrier out under the commissioning plan by personnel from the construction and Cx Teams. Site personnel will utilize Cx check sheets for recording installation deficiencies on a component/system basis. Timing of static inspections is tied to construction progress and occurs once the contractor's construction installation process and construction checks have been completed for the individual equipment components or systems.

User/Operator: A user or operator is an individual or group that will work in and operate various aspects of the facility once the project has been turned over.

Chapter 2 Building Information

Project Name:	AAFC Harrington Dust Collection System Replacement
Location:	Harrington, PE
Building Type:	Agricultural Processing Facility
Project Type:	Duct Collector System Replacement

Chapter 3 Commissioning Team

Table 1 – Project Team Information

Title	Name/Company	Contact Information
General Contractor	TBD	TBD
Commissioning Authority	Guillaume Savoie, CBCL Limited	14 King Street, PO Box 20040 Saint John, NB E2L 5B2 Ph.: (506) 633-6650 gsavoie@cbcl.ca
Architect	N/A	
Mechanical Designer	Pierre Arsenault, CBCL Ltd Matthew Peachman, CBCL Ltd	14 King Street, PO Box 20040 Saint John, NB E2L 5B2 Ph.: (506) 633-6650 pierrea@cbcl.ca
Electrical Designer	CBCL Ltd Claude Dupuis	
Client	Tim O'Brien, PWGSC Darcy Grant, PWGSC Jamie Coffin, AAFC	
Mechanical Contractor	TBD	TBD
Electrical Contractor	TBD	TBD
Controls Contractor	TBD	TBD

3.1 Project Team's Responsibilities

Table 2 – Project Team's Responsibilities

Commissioning Tasks	General Contractor	Commissioning Authority	Mechanical Engineer	Electrical Engineer	Contractors Site Cx Coordinator/Subcontra	Owner/Owners Rep
Plan and schedule design meetings			X			
Plan and schedule construction meetings	X				X	
Plan and schedule site inspections and operation tests	X	X			X	
Develop Cx Plan and edit as necessary		X				
Review and comment on Cx plan	X	X			X	X
Develop installation checklists					X	
Review installation checklists		X	X	X		
Complete installation checklists					X	
Develop start-up checklists					X	
Review start-up checklists		X	X	X		
Complete start-up and fill out checklists					X	
Review completed start-up checklists		X				
Develop PV checklists					X	
Perform PV and complete checklists					X	
Review completed PV checklists and witness system demonstration		X			X	X
Complete Progress Report		X				
Organize O&M manual	X				X	
Review and approve O&M manual		X	X	X		
Determine requirements of operator training		X				X
Conduct operator training	X				X	
Complete final Commissioning Report		X				
Attend 10-month warranty period meeting	X	X			X	X

3.2 Information Flow

Table 3 – Information Management

Issue	Protocol
For Requests For Information (RFI) or formal documentation requests.	The CxA goes first to the General Contractor. Copy to Owner.
For verbal information or clarification.	The CxA goes directly to the informed party. Copy of any resulting decisions to General Contractor and Owner.
For notifying contractors of deficiencies.	The CxA documents deficiencies through the General Contractor.
For scheduling functional tests or training.	Contractor's Cx Representative shall schedule. The CxA may provide input and do some coordination, but does not do any of the scheduling.
For making requests for significant changes.	The CxA has no authority to issue change orders.
Subcontractors disagreeing with requests or interpretations by the CxA.	The subcontractor should try to resolve with the CxA, but the General Contractor should be informed of all issues.

Chapter 4 Commissioning Scope

The following systems will be commissioned in this project.

4.1 HVAC Systems (including integral equipment controls)

- EMCS - Energy Monitoring and Control Systems (controlled devices, control loops and system integration);
- Dust collector including auxiliary devices;
- Exhaust canopies;
- Exhaust fans;
- Ductwork; and
- Testing and balancing (sampling) HVAC.

Chapter 5 Commissioning Process

The commissioning process is described herein.

5.1 Initial Commissioning Meeting

A commissioning meeting shall be called by the CxA within one month from the beginning of construction. In attendance shall be the General Contractor, Mechanical and Electrical Designers, Contractors Site Cx Coordinator (representing mechanical and electrical contractors), and all relevant subcontractors.

The meeting will review the reporting structure, lines of communication, the different parties' responsibilities, and the general schedule for site inspections, startup of equipment and training

The desired outcome of the meeting is a good understanding by all involved parties of the commissioning process and their individual responsibilities.

5.2 Final Commissioning Plan

Following the initial commissioning meeting, the CxA will finalize the commissioning plan. Added to the plan is the commissioning schedule that was discussed during the meeting.

5.3 Submittals

The CxA shall provide all subcontractors responsible for commissioned equipment with a list of the documentation required for the commissioning process. This list will be delivered through the General Contractor and Contractors Site Cx Coordinator.

The data is typically the same as the requirements of the Architect and Designer. It will include installation and startup procedures, O&M data, performance data and control drawings. The CxA will review the documents to ensure they meet the requirements of the basis of design and commissioning-related items mentioned in the contract documents. The CxA does not review for general contract compliance.

The recommendations from this review will be formally documented by the CxA and will be forwarded to the General Contractor

5.4 Site Meetings/Review

The CxA shall attend site meetings during the construction period as required. It is at these meetings that the General Contractor or Architect will report on the progress of construction and will share any information that will affect the commissioning schedule or the equipment and systems that are to be commissioned.

5.5 Installation Inspection

Prior to the startup of the equipment, all equipment shall be inspected and correct installation verified. This is done to reduce delays and damage to the 3equipment during start.

Every piece of equipment is inspected by the Installing Contractor. There is to be no sampling at this step. The CxA does not need to be present during each installation, but should be present for central pieces of equipment and has the right to inspect a sample of equipment of his/her choosing.

The installation checklists will be developed based upon the shop drawings.

All deficiencies are to be recorded and fixed before startup check and Functional test.

5.6 Startup Check

The startup check is the checkpoint to ensure each specific piece of equipment is operating as designed. The startup checklists are to be developed by the Contractor and review by the CxA.

The CxA shall review the startup documentation provided by the contractor.

All deficiencies are to be recorded and repaired.

5.7 Performance Verification

Performance verification is not only the testing of each piece of equipment but is also a check that the pieces of equipment together produce the proper final result.

It is the responsibility of the Site Commissioning Coordinator (Contractor) to schedule the performance verification tests with the subcontractors, the General Contractor, and the CxA.

It is the responsibility of the Site Commissioning Coordinator (Contractor) to document all results of the Performance verification tests. Any deficiencies are to be corrected by the subcontractor and retesting will be scheduled by the Site Commissioning Coordinator (Contractor). Any disputes regarding the requirement of retesting between the CxA and the subcontractor shall be handled by the Project Manager.

Once all equipment has been started and tested, the CxA and Owner's representative shall witness a full functional test of all central equipment and up to 10% of terminal equipment.

The performance verification test shall be developed by the Contractor and CxA.

5.8 Testing, Adjusting and Balancing

The contractor shall perform testing, adjusting and balancing (TAB) in accordance with the applicable sections of the specification. The CxA shall witness a portion of the TAB and will review the TAB documentation.

5.9 Progress Reports

The CxA shall supply the General Contractor with regular commissioning progress reports.

The progress reports will include an update of any schedule changes, the most recent site visit report, and a list of the current deficiencies.

5.10 O&M Manuals

The CxA shall review the O&M manuals before functional test. It is assumed that they will be 95% complete, with the remainder completed once functional test is complete.

The CxA will recommend either the acceptance or rejection of the O&M manuals.

It is not the responsibility of the CxA to produce the O&M manuals.

5.11 Training

Training to be provided as required in 01 91 00 General Cx Requirements and as required elsewhere in the specification.

The Contractors Site Cx Coordinator shall coordinate the training of the Owner/Operator.

5.12 Warranty

The project generally has a one (1) year warranty period, however the contractor is to coordinate with other specification sections for additional coverage where indicated. During this time, the following will occur:

- Seasonal testing of equipment, as required; and
- One final review prior to the end of the warranty period by the CxA, Contractors and Owner/Operator to review any occupant complaints.

5.13 Final Report

The CxA will supply the Owner with a final commissioning report.

For each piece of commissioned equipment, the final report will outline the following:

- Confirmation that the equipment meets the specifications;
- Confirmation that the equipment was installed correctly;
- Confirmation that the equipment was started up correctly;
- Functional test results; and

DRAFT

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APPENDIX A

Start-up/PV Checklists

HVAC SYSTEMS COMMISSIONING
VERIFICATION PROGRAM
DUST COLLECTOR

PROJECT:	**AAFC Dust Collector**	**UNIT #:**	
LOCATION:	**Pad Mount**	**SERVICE:**	**Dust Collector**
MANUFACTURER:		**MODEL:**	

Dust Collector Unit	**INSTALLED**
Manufacturer	
Model No.	
Size	
Serial No.	

FAN	**INSTALLED**
Manufacturer	
Type	
Size	
Model No.	
Motor (HP)	
Voltage / Phase / Frequency	
Air Volume (L/S)	
Static Pressure (Pa)	
Fan RPM	

Unit Installation	**STATUS**	**COMMENTS**
Concrete pad complete		
Bollards installed		
Installed as per manufacturer instructions		
Quality Of Duct Construction		
Ductwork Insulation		
Wall Penetrations Sealed		
Access for Inspection & Servicing		
Acoustic Lining Installation		
Silencer Installation		
Blast damper-installed and wired		
Ductwork supported		
Equipment enclosures installed as per drawings		
Compressed air piping installed and secured		
Power installed and secured		
Disconnect installed as per dwg		
Control wiring installed and secured.		

PROJECT:	**AAFC Dust Collector**	**UNIT #:**	
LOCATION:	**Pad Mount**	**SERVICE:**	**Dust Collector**
MANUFACTURER:		**MODEL:**	

SUPPLY FAN	**STATUS**	**COMMENTS**
Impeller Rotates Freely And Without Vibration		
Fan Casing Cleaned		
Belt Guards Installed		
Inlet & Outlet Guards Installed		
Duct Geometry Correct		
Flexible Connectors Correct		
Shipping Blocks Removed		
Vibration Isolators Correct		
Starters & Disconnects Installed		
Disconnect Location Correct		
Rotation Correct		
Belt Tension		
Interlocks Installed		

FILTERS	**STATUS**	**COMMENTS**
Panel Filters Slide Freely In Frames		
Filters Installed with Air Flow Direction Correct		
Access Doors Installed		

STARTUP	**STATUS**	**COMMENTS**
Unit started as per manufacturer's instructions		
Startup sheet attached		
Control panel installed as per drawing		

Operation and Control	**STATUS**	**COMMENTS**
The system shall be enabled by local wound timer for a maximum duration of [4] hours.		
The integral unit controls shall operate on a demand based cleaning cycle on a factory provided sensed differential pressure.		

PROJECT:	**AAFC Dust Collector**	**UNIT #:**	
LOCATION:	**Pad Mount**	**SERVICE:**	**Dust Collector**
MANUFACTURER:		**MODEL:**	

The bas shall trend the cleaning operation as sensed by the DC-01 cleaning pressure switch.		
The bas shall alarm on no flow condition as sensed by the blower differential pressure sensor.		
The bas shall alarm on filter dp above [1500 Pa].		
The bas shall alarm on consecutive cleaning pressure switch interval less than [5 minutes].		

Closeout	**STATUS**	**COMMENTS**
Training has been completed		
Received spares (compressed air filters, duct collector filters, specialized tools, belts)		

REMARKS:

Owners Representative		Date:
General Contractors Representative		Date:
Mechanical Contractors Representative		Date:
Commissioning Representative		Date:

HVAC SYSTEMS COMMISSIONING
VERIFICATION PROGRAM
EXHAUST FAN

PROJECT:	**AAFC Dust Collection**	**UNIT #:**	**EF-11-B1**
LOCATION:	**Wall-outside**	**SERVICE:**	**Grinding Room Gen Exh**
MANUFACTURER:		**MODEL:**	

EXHAUST FAN	**INSTALLED**
Type/ Size	
Motor HP	
Voltage / Phase / Frequency	
Static Pressure Air (Pa)	
Fan RPM	
Air Volume (L/S)	
Vibration Isolator Type	

EXHAUST FAN	**STATUS**	**COMMENTS**
Installed as per Drawings & Specifications		
Installed As Per Manufacturer's Requirements		
Fan Rotation Correct		
Fan Casing Cleaned		
Duct Geometry Correct		
Vibration Isolators Correct		
Starter & Disconnect Complete		
Belt Tension		
Fan Wheel Clearance		
Fan Interlocks Correct		

AIR DISTRIBUTION SYSTEM	**STATUS**	**COMMENTS**
Quality Of Duct Construction		
Suitability of Duct Fittings		
Wall Penetrations Sealed		
Access for Inspection & Servicing		
OPERATIONAL CHECKS		
All System Components Started as Detailed on Equipment Start-up Sheets.		
Noise & Vibration		
Air Balancing Complete		
Air Balance Report Attached		

MOTORIZED DAMPER	**MD-1**	**MD-2**	**MD-3**
Damper Location			
No Cracks Around Damper Frame			

HVAC SYSTEMS COMMISSIONING
VERIFICATION PROGRAM
EXHAUST FAN

PROJECT:	**AAFC Dust Collection**	**UNIT #:**	**EF-11-B1**
LOCATION:	**Wall-outside**	**SERVICE:**	**Grinding Room Gen Exh**
MANUFACTURER:		**MODEL:**	

MOTORIZED DAMPER	**MD-1**	**MD-2**	**MD-3**
Blades Close Fully, Seal Tightly			
Motorized Damper Strokes Fully Open to Fully Closed			
Access to Damper			
Normal Positions as Specified			
Damper Control Sequences			

CONTROLS	**STATUS**	**COMMENTS**
The system shall be enabled by local wound timer for a maximum duration of [4] hours.		
On system enable the motorized damper shall open.		
On proof of open from the damper, the exhaust fan shall be energized.		
The bas shall alarm on a fault from the damper.		
The bas shall alarm on a fault from the exhaust fan.		

CLOSEOUT	**STATUS**	**COMMENTS**
Training has been completed.		
Received spares (bearings and seals, specialized tools).		

REMARKS:

Owners Representative		Date:
General Contractors Representative		Date:
Mechanical Contractors Representative		Date:
Commissioning Representative		Date:

HVAC SYSTEMS COMMISSIONING
VERIFICATION PROGRAM
EXHAUST FAN

PROJECT:	**AAFC Dust Collection**	**UNIT #:**	**EF-11-B2**
LOCATION:	**Wall-outside**	**SERVICE:**	**Grinding Room Gen Exh**
MANUFACTURER:		**MODEL:**	

EXHAUST FAN	**INSTALLED**
Type/ Size	
Motor HP	
Voltage / Phase / Frequency	
Static Pressure Air (Pa)	
Fan RPM	
Air Volume (L/S)	
Vibration Isolator Type	

EXHAUST FAN	**STATUS**	**COMMENTS**
Installed as per Drawings & Specifications		
Installed As Per Manufacturer's Requirements		
Fan Rotation Correct		
Fan Casing Cleaned		
Duct Geometry Correct		
Vibration Isolators Correct		
Starter & Disconnect Complete		
Belt Tension		
Fan Wheel Clearance		
Fan Interlocks Correct		

AIR DISTRIBUTION SYSTEM	**STATUS**	**COMMENTS**
Quality Of Duct Construction		
Suitability of Duct Fittings		
Wall Penetrations Sealed		
Access for Inspection & Servicing		
OPERATIONAL CHECKS		
All System Components Started as Detailed on Equipment Start-up Sheets.		
Noise & Vibration		
Air Balancing Complete		
Air Balance Report Attached		

MOTORIZED DAMPER	**MD-1**	**MD-2**	**MD-3**
Damper Location			
No Cracks Around Damper Frame			

HVAC SYSTEMS COMMISSIONING
VERIFICATION PROGRAM
EXHAUST FAN

PROJECT:	**AAFC Dust Collection**	**UNIT #:**	**EF-11-B2**
LOCATION:	**Wall-outside**	**SERVICE:**	**Grinding Room Gen Exh**
MANUFACTURER:		**MODEL:**	

MOTORIZED DAMPER	**MD-1**	**MD-2**	**MD-3**
Blades Close Fully, Seal Tightly			
Motorized Damper Strokes Fully Open to Fully Closed			
Access to Damper			
Normal Positions as Specified			
Damper Control Sequences			

CONTROLS	**STATUS**	**COMMENTS**
The system shall be enabled by local wound timer for a maximum duration of [4] hours.		
On system enable the motorized damper shall open.		
On proof of open from the damper, the exhaust fan shall be energized.		
The bas shall alarm on a fault from the damper.		
The bas shall alarm on a fault from the exhaust fan.		

CLOSEOUT	**STATUS**	**COMMENTS**
Training has been completed.		
Received spares (bearings and seals, specialized tools).		

REMARKS:

Owners Representative		Date:
General Contractors Representative		Date:
Mechanical Contractors Representative		Date:
Commissioning Representative		Date:

APPENDIX B

Commissioning Schedule (to follow)

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