METROLINX

Capital Projects Group

Air Curtains Specification

Specification 23 33 45

Revision 0
Date: August 2018

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Amendment Record Sheet

Amendment in Clause No.	Date of Amendment	Description of Changes

LIST OF CONTENT

1. GENERAL

1.1. SCOPE OF WORK

1.1.1. Provide air curtains as required, scheduled and specified herein.

1.2. DESIGN REQUIREMENTS

1.2.1. Metrolinx air curtains design guidelines.

1.2.2. Design requirements are based on Part 2 specified requirements of products.

1.3. RELATED WORKS

1.3.1. Section 20 05 05 - Mechanical Work General Instructions.

1.3.2. Section 20 05 10 - Basic Mechanical Materials and Methods.

1.3.3. Section 20 05 40 – Mechanical Work Commissioning.

1.4. REFERENCE STANDARDS

1.4.1. Standards and codes to be latest editions adopted by and enforced by local governing authorities.

1.4.2. ANSI/AMCA Standard 210, Laboratory Method of Testing Fans for Certified Aerodynamic Performance Rating.

1.4.3. AMCA Standard 211, Product Rating Manual for Fan Air Performance.

1.4.4. AMCA Standard 99-2408, Operating Limits for Centrifugal Fans.

1.4.5. ARI 410 Forced-Circulation Air-Cooling and Air-Heating Coils.

1.5. TRAINING

1.5.1. Training is to be a full review of all components including but not limited to a full operation and maintenance demonstration, with abnormal events.

1.5.2. Include for 3 training sessions of maximum 7 hours duration per session for 10 Metrolinx people per session.

1.5.3. Refer to Section 20 05 05 for additional general requirements.

1.6. WARRANTY

1.6.1. Products to be guaranteed by manufacturer, for a minimum of 2 years warranty after acceptance by Metrolinx.

1.6.2. Provide additional extended warranty to total of 5 years.

1.7. DELIVERY, STORAGE AND HANDLING.

1.7.1. Handle and store products in accordance with manufacturer's instructions, in locations approved by Metrolinx. Include one copy of these instructions with product at time of shipment.

1.8. SUBMITTALS

1.8.1. Refer to submittal requirements in Section 20 05 05.

1.8.2. Submit with delivery of each unit a copy of the factory inspection report, and include a copy of each report with O & M Manual project close-out data.

1.8.3. Submit a signed copy of manufacturer's extended five year parts and labour warranty.

1.8.4. Submit shop drawings/product data sheets as follows:

a) to regulatory authority for review and approval prior to submitting to Consultant;

b) for all products specified in this Section except pipe and fittings.

1.8.5. Product Data

a) Submit product data sheets indicating:

1) technical data, supplemented by bulletins, component illustrations, detailed views, technical descriptions of items, and parts lists;

2) performance criteria, compliance with appropriate reference standards, characteristics, limitations, and troubleshooting protocol. Include certified fan performance curves;

3) product transportation, storage, handling, and installation requirements;

4) product identification in accordance with Metrolinx requirements.

1.8.6. Shop Drawings

a) Submit shop drawings for products indicating:

1) type of units, capacity and ratings;

2) mounting details to suit locations shown, indicating methods and hardware to be used;

3) control components and control wiring schematic;

4) site inspection and start-up report from manufacturer's representative.

1.8.7. Commissioning Package

a) Submit the following in accordance with Sections 20 05 05 and 20 05 40:

1) Commissioning Plan;

2) Commissioning Procedures;

3) Certificate of Readiness;

4) complete test sheets specified in Section 20 05 40 and attach them to the Certificate of Readiness;

5) Source Quality Control inspection and test results and attach to the Certificate of Readiness.

1.8.8. Commissioning Closeout Package

a) Submit the following in accordance with Section 20 05 05:

1) Deficiency Report;

2) Commissioning Closeout Report;

3) submit the following for each Product for incorporation into the Operation and Maintenance Manuals in accordance with Section 20 05 05:

i) identification: manufacturer's name, type, year, serial number, number of units, capacity, and identification to related systems;

ii) functional description detailing operation and control of components;

iii) performance criteria and maintenance data;

iv) safety precautions;

v) operating instructions and precautions;

vi) component parts availability, including names and addresses of spare part suppliers;

vii) maintenance and troubleshooting guidelines/protocol;

viii) product storage, preparation, handling, and installation requirements;

ix) Commissioning Report.

1.9. QUALITY ASSURANCE

1.9.1. Site personnel are to be licensed in jurisdiction of the work and under continuous supervision of a foreman who is an experienced system installer and a journeyman licensed in jurisdiction of the work.

1.9.2. Check and verify dimensions and conditions at site and ensure work can be performed as indicated. Coordinate work with trades at site.

1.9.3. Manufacturers Qualifications

a) Manufacturer shall be ISO 9000, 9001 or 9002 certified. Manufacturer of product shall have produced similar product for a minimum period of five years. When requested by Consultant, an acceptable list of installations with similar product shall be provided demonstrating compliance with this requirement.

b) Air Curtain manufacturers are to be current members of Air Movement and Control Association International Inc. (AMCA), and fans are to be rated (capacity and sound performance) and certified in accordance with requirements of following standards:

1) ANSI/AMCA Standard 210, Laboratory Method of Testing Fans for Certified Aerodynamic Performance Rating;

2) AMCA Standard 211, Product Rating Manual for Fan Air Performance;

3) AMCA Standard 99-2408, Operating Limits for Centrifugal Fans.

c) Where manufacturers provide after installation onsite inspection of product installations, include for manufacturer's authorized representative to perform onsite inspection and certificate of approvals.

1.9.4. Installers Qualifications

a) Installers for work to be performed by or work under licensed Mechanical Contractor.

b) Installers of equipment, systems and associated work are to be fully qualified and experienced installers of respective products and work in which they are installing.

c) Where manufacturers provide training sessions to installers and certificates upon successful completion, installers to have obtained such certificates and submit copies with shop drawings.

1.9.5. Regulatory Requirements

a) Products and work to comply with applicable local governing authority regulations, bylaws and directives.

b) Include for required inspections and certificate of approvals of installation work from local governing authorities.

2. PRODUCTS

2.1. AIR CURTAINS

2.1.1. Berner International Corp. or approved equivalent, CSA certified factory assembled air curtains in accordance with drawing schedule, each factory performance tested and certified and of sufficient structural strength to be supported from the ends without deflection or intermediate support.

2.1.2. Cabinet constructed of welded stainless steel suitable for vertical or horizontal wall mounting or horizontal suspension and complete with removable panels for access to interior components, perforated stainless steel air intake with stainless steel filter and frame, and required stainless steel mounting accessories for mounting as indicated.

2.1.3. Stainless steel discharge nozzle to facilitate uniform velocity across width of door, complete with minimum 65 mm (2-½") wide aperture and airfoil shaped, adjustable, aluminium extrusion deflection vanes.

2.1.4. Non-overloading double width and inlet galvanized steel wheel with forward curved blades and galvanized steel housing complete with aerodynamically formed inlet venturi and statically and dynamically balanced as an assembly. Each wheel is to be driven through a flexible coupling and is to be supported by two permanently lubricated sealed ball type bearings encased in vibration isolating rubber cartridges.

2.1.5. TEFC motor conforming to requirements specified in Section entitled Basic Mechanical Materials and Methods and direct connected to fan wheel.

2.1.6. Factory pre-wired power and control panel, air curtain mounted or supplied loose for field mounting as shown, complete with a NEMA 4 oil and dust tight enclosure with gasketed door, lockable unfused disconnect switch, motor starter, motor overloads, 24 volt secondary control transformer, power and control wiring terminal strip, adjustable time delay relay (0.1 second to 10 hours delay) factory set at one minute unless otherwise specified, and a H-O-A switch to permit manual on/off operation of air curtain or automatic on/off operation controlled by a door switch.

2.1.7. Dry contacts and any other required hardware in control panel for building automation system interface in accordance with drawings.

2.1.8. Mounting brackets and hardware to suit specific installation requirements. Factory secured seismic restraint connection hardware.

2.1.9. Heating elements: refer to article 2.2 – Heating Elements in this Section for requirements.

2.1.10. Standard of quality assurance manufacturers are:

a) Berner International Corp.;

b) Miniveil Air Systems;

c) Mars Air Systems Co;

d) or approved equivalent.

2.2. HEATING ELEMENTS OF AIR CURTAINS

2.2.1. Electric Heating Coil

a) CSA approved / ULC labelled and listed, factory-mounted, factory-wired, thermally-protected, with galvanized steel frame.

b) Venturi mounted or duct mount helical coil with barrel or point supported elements.

c) Thermal Cutout: Locks out electric heaters when prolonged abnormal over-temperature conditions exist.

d) Automatic and manual reset limit controls, primary magnetic contactors, equipment grounding lug, power fusing, and control transformer.

2.2.2. Hot Water Coil

a) Certified in accordance with ARI 410; constructed from 15.8 mm (5/8-inch) outside diameter copper tube with aluminum fins.

b) Characteristics: Design to operate at maximum 1720-kPa (250-psig) and 149 degrees C (300 degrees F) hot water.

c) Leak-test under water at 2410-kPa (350-psig) dry nitrogen.

d) Factory mount coil on air intake and protect with perforated metal screen.

2.2.3. Indirect Gas Heater and Duct Transition

a) CSA listed.

b) Fuel Type: orifices for natural gas.

c) Heat Exchanger and Burner: stainless steel.

d) Features: power exhaust vent, voltage limit control, 24-volt control voltage transformer, combustion air pressure switch, spark ignited intermittent safety pilot system with electronic flame supervision.

e) Independently support each heater at least 25 mm (1 inch) from each opening of factory-installed duct transition. Construct duct transition from 16-gage aluminized steel with access panels spanning entire width.

2.2.4. Direct Gas Fired Heater

a) Fuel Type: orifices for natural gas.

b) Features: minimum turndown ratio of 30:1 stainless steel baffles, non-clogging orifices, ignition system, flame safeguard, gas manifold, valves, and temperature controls.

c) Gas Manifold (Train): As required by CSA, ANSI, and FM.

d) Spark ignited intermittent pilot.

3. EXECUTION

3.1. INSTALLATION OF AIR CURTAINS

3.1.1. Provide air curtains at exterior doors. Install appropriate type to suit installation.

3.1.2. Secure each air curtain in place from structure, as close as practicable to door entrance, square, level and plumb, using mounting hardware supplied, in accordance with requirements of reviewed shop drawings/product data and air curtain manufacturer's instructions. Provide any supplementary structural steel required.

3.1.3. Where required, brace and secure each unit in accordance with local governing code requirements for seismic control and restraint.

3.1.4. Take into account clearances required for door maintenance.

3.1.5. Wall mount control panel adjacent to door control panel. Provide interlock wiring between door switch dry contacts of the door panel and the air curtain panel such that air curtain operates when door opens, and shuts down when door closes. Interlock wiring is to be installed in conduit in accordance with wiring requirements of electrical work.

3.1.6. Adjust air curtain nozzles as required so air is directed, unobstructed, towards door opening.

3.1.7. Connect units with required utility services in accordance with respective code requirements and manufacturer’s instructions.

3.1.8. Refer to Section 20 05 10 for equipment/system manufacturer certification requirements.

3.1.9. Refer to Section 20 05 10 for equipment/system start-up requirements.

END OF SECTION