MECHANICAL ADDENDUM #M-1
NATIONAL DEFENSE, CFB BORDEN, ON
VICKERS KITCHEN AND DINING FACILITY
H-B147-4902/1
MAY 16, 2013

The following document is hereby made a part of the Contract Documents.

The following revisions and/or additions shall be made to Drawings and/or specifications and the cost shall be included in Tender Price.

REVISIONS TO SPECIFICATIONS

SECTION 23 08 34 – PRESSURE TESTING OF DUCTED AIR SYSTEMS

1. Add new attached Section 23 08 34 – Pressure Testing of Ducted Air Systems (4 pages).

END

1 General

1.1 **SUMMARY**

1 Section Includes:
.1 Materials and methods for pressure testing ducts over 5.0 m in length, forming part of a supply, return or exhaust ductwork system directly or indirectly connected to air handling equipment.

.2 Related Sections:
.1 Division 01 of these specifications applies to the entire specification.

1.2 **REFERENCES**

1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.2 Sheet Metal and Air Conditioning Contractor's National Association (SMACNA)
.1 SMACNA HVAC Air Duct Leakage Test Manual, 2012.

1.3 **SUBMITTALS**

.1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Co-ordinate submittal requirements and provide submittals required by Section 01 33 00 - Submittal Procedures.

.3 Test Reports: submit certified test reports from approved independent testing laboratories indicating compliance with specifications for specified performance characteristics and physical properties. Include pressure test information and results as follows:

.4 Submit proposed report form and test report format to DCC Representative for approval at least three months before proposed date of first series of tests. Do not start tests until approval received in writing from DCC Representative.

.5 Prepare report of results and submit to DCC Representative within 24 hours of completion of tests. Include:
.1 Schematic of entire system.
.2 Schematic of section under test showing test site.
.3 Required and achieved static pressures.
.4 Orifice differential pressure at test sites.
.5 Permissible and actual leakage flow rate (L/s) for test sites.
.6 Witnessed certification of results.

.6 Include test reports in final TAB report.

.7 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.8 Instructions: submit manufacturer's installation instructions.
Manufacturer's field reports specified.

1.4 **QUALITY ASSURANCE**

.1 Pre-Installation Meetings:
- .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations.
  - .1 Verify project requirements.
  - .2 Review installation and substrate conditions.
  - .3 Co-ordination with other building subtrades.
  - .4 Review manufacturer's installation instructions and warranty requirements.

2 Products

2.1 **TEST INSTRUMENTS**

.1 Test apparatus to include:
- .1 Fan capable of producing required static pressure.
- .2 Duct section with calibrated orifice plate mounted and accurately located pressure taps.
- .3 Flow measuring instrument compatible with the orifice plate.
- .4 Calibration curves for orifice plates used.
- .5 Flexible duct for connecting to ductwork under test.
- .6 Smoke bombs for visual inspections.

.2 Test apparatus: accurate to within +/- 3% of flow rate and pressure.

.3 Submit details of test instruments to be used to DCC Representative at least three months before anticipated start date.

.4 Test instruments: calibrated and certificate of calibration deposited with DCC Representative no more than 28 days before start of tests.

.5 Re-calibrated every six months thereafter.

2.2 **EQUIPMENT LEAKAGE TOLERANCES**

.1 Equipment and system components such as VAV boxes, duct heating leakage:
- .1 2%.

3 Execution

3.1 **MANUFACTURER'S INSTRUCTIONS**

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.

3.2 **TEST PROCEDURES**

.1 Maximum lengths of ducts to be tested consistent with capacity of test equipment.

.2 Section of duct to be tested to include:
.1 Fittings, branch ducts, tap-ins.

.3 Repeat tests until specified pressures are attained. Bear costs for repairs and repetition to tests.

.4 Base partial system leakage calculations on SMACNA HVAC Air Duct Leakage Test Manual.

.5 Seal leaks that can be heard or felt, regardless of their contribution to total leakage.

3.3 **SITE TOLERANCES**

.1 System leakage tolerances specified are stated as percentage of total flow rate handled by system. Pro-rate specified system leakage tolerances. Leakage for sections of duct systems: not to exceed total allowable leakage.

.2 Leakage tests on following systems not to exceed specified leakage rates.
.1 Small duct systems up to 250 Pa: leakage 2%
.2 VAV box and duct on downstream side of VAV box: leakage 2%.
.3 Large low pressure duct systems up to 500 Pa: leakage 2%.
.4 HP duct systems up to 1000 Pa pressure classification, including upstream side of VAV boxes: leakage 1%.

.3 Evaluation of test results to use surface area of duct and pressure in duct as basic parameters.

3.3 **TESTING**

.1 Pressure test all duct sections.

.2 Test ducts before installation of insulation or other forms of concealment.

.3 Pressure test the Kitchen exhaust ductwork as per NFPA 96.

.4 Test after seals have cured.

.5 Test when ambient temperature will not affect effectiveness of seals, and gaskets.

.6 Test flexible connections to VAV boxes.

3.5 FIELD QUALITY CONTROL

.1 Performance Verification:
- .1 DCC Representative and Contractors Cx Agent or Representative to witness tests and to verify reported results.
- .2 Test to be conducted by TAB agency approved by DCC Representative to undertake TAB on this project.

3.6 CLEANING

.1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END