

SECTION 018550 - BLOWER DOOR TESTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes procedural requirements for quality assurance and quality control.
- B. Requirements of this section will include performing a Blower Door Tests.
- C. Tests will be performed by Owner's representative with some preparation by the Contractor.

1.2 DEFINITIONS

- A. Blower Door Test: A blower door test is used to quantify building air leakage. The standard blower door test is a depressurization test. This means that air will be blown out from the building, creating a negative pressure in the building.
- B. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.3 SUBMITTALS

- A. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Ambient conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- B. MSHA Submittals:
 - 1. Inspection/Commissioning: R 2: For each project, a representative number of units, as well as the entire building, as determined by MSHA, must be "Blower Door" tested to verify effectiveness of air.

1.4 QUALITY CONTROL

- A. Perform test in accordance with CGSB Standard 149, “Determination of the Airtightness of Building Envelopes by Fan Depressurization Method, Canadian General Standards Board” or ASTM E779 “Test Method for Determining Air Leakage by Fan Pressurization.”
- B. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PRE-TEST PREPARATION

- A. Before conducting the blower door test, the building needs to be placed in its normal heating or cooling configuration. This includes closing operable openings and preparing combustion appliances. The building that is to be tested should be prepared in the following ways:
 - 1. The building should be wired with at least one working 20-amp circuit available to power the blower door fan and usually, the accompanying fog testing equipment.
 - 2. The forces created by the blower door fan for this test (up to at least 50 Pascals) are quite powerful and will tear material from walls that is not securely fastened. Sheetrock and rigid foam will hold, Tyvek, poly, and aluminum vapor and air-barrier materials probably will not.

3.2 DOORS AND WINDOWS

- A. A doorway must be provided that can be sealed and off limits to usage for the duration of the test. For the blower door test this will be up to one hour, but the fog test and on-the-spot air sealing work this could be a half day or longer.
- B. All interior doors must be open.
- C. Close all storm and prime windows.
- D. Close all exterior doors and attic or crawl space hatches connected to heated spaces. Also close exterior crawl space hatches.
- E. Open all interior doors to rooms that are heated. The object here is to treat the entire building as one heated space. Because few basements can be completely sealed from the building and usually some heat to the basement is desirable, they are typically included as a heated space.

- F. Tape plastic over window air conditioners if they appear to be a source of air leakage into the building and they are normally removed during the winter. Close the AC fresh air vents.

3.3 COMBUSTION APPLIANCES - EXHAUST DEVICES

- A. Adjust any combustion appliances so they do not turn on during the test. This is usually done by turning off power to the heating system and turning the water heater to the “Pilot” setting. NOTE: If vented combustion appliances turn on during a depressurization test, it is possible for flames to be sucked out of the combustion air inlet (flame rollout). This is a fire hazard.
- B. Be sure that fires in fireplaces and woodstoves are completely out. Take precautions to prevent ashes from being blown into the building during the test. In most cases, closing dampers and doors is sufficient, but when they are leaky or absent, it will be necessary to either tape doors shut, clean out the ashes, or cover the ashes with wet newspaper.
- C. Turn off any exhaust fans, vented dryers, air conditioners and HVAC fans.
- D. Do not seal combustions flues, dryer vents, or ventilation system exhaust or intake vents that are normally open in the winter.

3.4 BLOWER DOOR TEST PROCEDURES

- A. Perform two separate tests for each unit as well as two tests for the entire building. For the first tests, the contractor shall arrange for the building to be tested preliminarily as early in the construction process as possible, to allow for leaks to be identified and sealed. Ideally, the test occurs as soon as the framing and sheathing installation is complete and before any insulation is installed. The second tests should be performed as soon as the individual units are closed in and prior to final finishes (base, door and window trim, painting, etc.).
- B. Install blower door frame, panel, and fan in an exterior doorway with a clear path to outdoors.
- C. Follow manufacturer’s instruction for fan orientation and manometer setup for either pressurization or depressurization.
- D. Connect the building-pressure manometer to measure building WRT outdoors.
- E. Connect the airflow manometer to measure fan WRT zone near fan inlet. The zone near the fan inlet is indoors for depressurization and outdoors for pressurization.
- F. Make pretest adjustments to manometer following manufacturer’s instruction. Zero manometers as described previously.
- G. Turn on the fan and increase its speed until you read 50 pascals of pressure difference between indoors and outdoors.
- H. Read the CFM₅₀ from the airflow manometer or from the second channel of a two-channel digital manometer.

PEARL PLACE 2

- I. If the building cannot be depressurized to -50 pascals, depressurize to highest multiple of 5 and multiply your measured airflow by the “can’t reach fifty” (CRF) factors in the following conversion table:

Building Pressure	15	20	25	30	35	40	45
CRF Factor	2.2	1.8	1.6	1.4	1.3	1.2	1.1

3.5 REQUIREMENTS

- A. Natural Air Changes per Hour (ACH_{nat}) shall be less than or equal to 0.25 Air Changes per Hour (ACH_{50}), where (ACH_{nat}) equals $((ACH_{50}) \text{ divided by LBL Factor}) \text{ times } ACH_{50}$

END OF SECTION 018550